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NAS WHITING FIELD
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REMEDIAL INVESTIGATION REPORT FOR SURFACE AND SUBSURFACE SOIL SITES 3, 4,
6, 30, 32, AND 33 VOLUME II OF II NAS WHITING FIELD FL
9/1/1999
TETRA TECH

REMEDIAL INVESTIGATION REPORT

FOR

SURFACE AND SUBSURFACE SOIL SITES 3, 4, 6, 30, 32, AND 33

Naval Air Station
Whiting Field
Milton, Florida

VOLUME II OF II



Southern Division
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HUMAN HEALTH RISK DATA

APPENDIX D1

RECEPTOR-SPECIFIC EXPOSURE PARAMETERS

TABLE D1 - 1
DAILY INTAKE CALCULATION PARAMETERS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Soil
Exposure Point: Exposed Surface Soil
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	INGESTION: $\text{Intake} = \text{CS} \times \text{IR} \times \text{FI} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	IR	Ingestion Rate	mg/day	100	USEPA 1991	50	USEPA 1996	
	FI	Fraction Ingested	unitless	1	USEPA 1992	1	USEPA 1995	
	EF	Exposure Frequency	days/year	45	Assumption	45	USEPA 1991	
	ED	Exposure Duration	years	10	USEPA 1995	2	USEPA 1992b	
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	BW	Body Weight	kg	45	USEPA 1995	45	USEPA 1995	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
Dermal	AT-N	Averaging Time (Non-Cancer)	days	3,650	USEPA 1989	730	USEPA 1992b	DERMAL: $\text{Intake} = \text{CS} \times \text{AF} \times \text{SA}_{\text{adj}} \times \text{ABS} \times \text{EF} \times \text{CF}$ AT $\text{SA}_{\text{adj}} = \text{SUM} [(\text{SA}_i \times \text{EDI}) / \text{BW}]$
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific		
	CF	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	SA	Skin Surface Area Available for Contact	cm ² -year/kg	1,013	USEPA 1992	1,013	USEPA 1992a	
	AF	Adherence Factor	mg/cm ²	1	USEPA 1995	0.2	USEPA 1992a	
	ABS	Absorption Factor	unitless	chemical specific	seeText	chemical specific	see Text	
	EF	Exposure Frequency	days/year	45	Assumption	45	USEPA 1991	
	ED	Exposure Duration	years	age specific	USEPA 1989	age specific		
	BW	Body Weight	kg	age-specific	USEPA 1989	age specific		
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	USEPA 1989	730	USEPA 1992b	

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002.

USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".

USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications". EPA/600/8-91/011B.

USEPA 1992b, Region VI Memorandum, Central Tendency and RME Exposure Parameters.

USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

USEPA 1996, Exposure Factors Handbook, 1996.

TABLE D1 - 2
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
 Medium: Soil
 Exposure Medium: Soil
 Exposure Point: Exposed Surface
 Receptor Population: Trespasser
 Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	INGESTION: $\text{Intake} = \text{CS} \times \text{IR} \times \text{FI} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	IR	Ingestion Rate	mg/day	100	USEPA 1995	50	USEPA 1996	
	FI	Fraction Ingested	unitless	1	USEPA 1992	1	USEPA 1995	
	EF	Exposure Frequency	days/year	45	Assumption	45	USEPA 1992b	
	ED	Exposure Duration	years	20	Assumption	7	USEPA 1992b	
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
Dermal	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	DERMAL: $\text{Intake} = \text{CS} \times \text{AF} \times \text{SA} \times \text{ABS} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	7,300	USEPA 1989	2,555	USEPA 1989	
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	
	CF	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	SA	Skin Surface Area Available for Contact	cm ²	5,750	USEPA 1992	5,000	USEPA 1992a	
	AF	Adherence Factor	mg/cm ²	1	USEPA 1991	0.2	USEPA 1992a	
	ABS	Absorption Factor	unitless	chemical specific	see Text	chemical specific	see Text	
	EF	Exposure Frequency	days/year	45	Assumption	45	USEPA 1992b	
	ED	Exposure Duration	years	20	Assumption	7	USEPA 1992b	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	7,300	USEPA 1989	2,555	USEPA 1989	

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002.

USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".

USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications". EPA/600/8-91/011B.

USEPA 1992b, Region VI Memorandum, Central Tendency and RME Exposure Parameters.

USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

USEPA 1996, Exposure Factors Handbook, 1996.

TABLE D1 - 3
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
 Medium: Soil
 Exposure Medium: Soil
 Exposure Point: Exposed Surface
 Receptor Population: Site Occupational Worker
 Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	INGESTION: $\text{Intake} = \text{CS} \times \text{IR} \times \text{FI} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	IR	Ingestion Rate	mg/day	50	USEPA 1995	50	USEPA 1996	
	FI	Fraction Ingested	unitless	1	USEPA 1992	1	Assumption	
	EF	Exposure Frequency	days/year	250	USEPA 1995	250	USEPA 1992b	
	ED	Exposure Duration	years	25	USEPA 1995	9	USEPA 1992b	
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1989	
Dermal	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	DERMAL: $\text{Intake} = \text{CS} \times \text{AF} \times \text{SA} \times \text{ABS} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	3,285	USEPA 1992b	
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	
	CF	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	SA	Skin Surface Area Available for Contact	cm ²	2,300	USEPA 1992	2,300	USEPA 1996	
	AF	Adherence Factor	mg/cm ²	1	USEPA 1991	0.2	USEPA 1992a	
	ABS	Absorption Factor	unitless	chemical specific	seeText	chemical specific	seeText	
	EF	Exposure Frequency	days/year	250	USEPA 1995	250	USEPA 1995	
	ED	Exposure Duration	years	25	USEPA 1995	9	USEPA 1992b	
	BW	Body Weight	kg	70	USEPA 1991	70		
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	3,285	USEPA 1992b	

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002.

USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".

USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications". EPA/600/8-91/011B.

USEPA 1992b, Region VI Memorandum, Central Tendency and RME Exposure Parameters.

USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

USEPA 1996, Exposure Factors Handbook, 1996.

TABLE D1 - 4
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Soil
Exposure Point: Exposed Surface
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	INGESTION: Intake = $CS \times IR \times FI \times EF \times ED \times CF$ BW x AT
	IR	Ingestion Rate	mg/day	50	USEPA 1995	50	USEPA 1995	
	FI	Fraction Ingested	unitless	1	USEPA 1992	1	Assumption	
	EF	Exposure Frequency	days/year	30	Assumption	30	Assumption	
	ED	Exposure Duration	years	25	USEPA 1995	9	USEPA 1992b	
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
Dermal	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	DERMAL: Intake = $CS \times AF \times SA \times ABS \times EF \times ED \times CF$ BW x AT
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	3,285	USEPA 1991	
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	chemical specific	⁽¹⁾	
	CF	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	SA	Skin Surface Area Available for Contact	cm2	5,750	USEPA 1992	5,000	USEPA 1992a	
	AF	Adherence Factor	mg/cm2	1	USEPA 1995	0.2	USEPA 1993	
	ABS	Absorption Factor	unitless	chemical specific	seeText	chemical specific	see Text	
	EF	Exposure Frequency	days/year	30	Assumption	30	Assumption	
	ED	Exposure Duration	years	25	USEPA 1995	9	USEPA 1992b	
	BW	Body Weight	kg	70	USEPA 1991	70	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA 1989	3,285	USEPA 1989	

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), [EPA/540/1-89/002](#).
USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".
USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications". [EPA/600/8-91/011B](#).
USEPA 1992b, Region VI Memorandum, Central Tendency and RME Exposure Parameters.
USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".
USEPA 1996, Exposure Factors Handbook, 1996.

TABLE D1 - 5
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Soil
Exposure Point: Surface Soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	NE		INGESTION: Intake = $CS \times IR \times FI \times EF \times ED \times CF$ $BW \times AT$
	IR	Ingestion Rate	mg/day	480	USEPA 1995	NE		
	FI	Fraction Ingested	unitless	1	Assumption	NE		
	EF	Exposure Frequency	days/year	30	Assumption	NE		
	ED	Exposure Duration	years	1	USEPA 1995	NE		
	CF1	Conversion Factor	kg/mg	10^{-6}		NE		
	BW	Body Weight	kg	70	USEPA 1991	NE		
Dermal	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	NE		DERMAL: Intake = $CS \times AF \times SA \times ABS \times EF \times ED \times CF$ $BW \times AT$
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA 1989	NE		
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	NE		
	CF	Conversion Factor	kg/mg	10^{-6}		NE		
	SA	Skin Surface Area Available for Contact	cm ²	5,750	USEPA 1992a	NE		
	AF	Adherence Factor	mg/cm ²	1	USEPA 1995	NE		
	ABS	Absorption Factor	unitless	chemical specific	seeText	NE		
	EF	Exposure Frequency	days/year	30	Assumption	NE		
	ED	Exposure Duration	years	1	USEPA 1995	NE		
	BW	Body Weight	kg	70	USEPA 1991	NE		
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	NE		
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA 1989	NE		

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

NE - not evaluated since the RME risk was less than the USEPA and FDEP target level for all sites
USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002.
USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".
USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.
USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

TABLE D1 - 6
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Soil
Exposure Point: Subsurface Soil
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	NE		<p>INGESTION:</p> <p>Intake = $CS \times IR \times FI \times EF \times ED \times CF$</p> <p>BW x AT</p>
	IR	Ingestion Rate	mg/day	480	USEPA1995	NE		
	FI	Fraction Ingested	unitless	1	Assumption	NE		
	EF	Exposure Frequency	days/year	30	Assumption	NE		
	ED	Exposure Duration	years	1	USEPA 1991	NE		
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		NE		
	BW	Body Weight	kg	70	USEPA 1991	NE		
Dermal	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	NE		<p>DERMAL:</p> <p>Intake = $CS \times AF \times SA \times ABS \times EF \times ED \times CF$</p> <p>BW x AT</p>
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA 1989	NE		
	CS	Chemical Concentration in Soil	mg/kg	chemical specific	⁽¹⁾	NE		
	CF	Conversion Factor	kg/mg	10 ⁻⁶		NE		
	SA	Skin Surface Area Available for Contact	cm2	5,750	USEPA 1992a	NE		
	AF	Adherence Factor	mg/cm2	1	USEPA 1995	NE		
	ABS	Absorption Factor	unitless	chemical specific	seeText	NE		
	EF	Exposure Frequency	days/year	30	Assumption	NE		
	ED	Exposure Duration	years	1	USEPA 1991	NE		
	BW	Body Weight	kg	70	USEPA 1991	NE		
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	NE		
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA 1989	NE		

⁽¹⁾ See Tables 6-12 through 6-22 of text.

References:

NE - not evaluated since the RME risk was less than the USEPA and FDEP target level for all sites

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002

USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".

USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications". EPA/600/8-91/011B.

USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

TABLE D1 - 7
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Future
 Medium: Soil
 Exposure Medium: Soil
 Exposure Point: Surface
 Receptor Population: Resident
 Receptor Age: Adult/Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value (adult/child)	RME Rationale/Reference	CT Value (adult/child)	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical specific	(¹)	chemical specific	(¹)	INGESTION: $\text{Intake} = \text{CS} \times \text{IR} \times \text{FI} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	IR	Ingestion Rate	mg/day	100 / 200	USEPA 1995	50 / 100	USEPA 1995	
	FI	Fraction Ingested	unitless	1	USEPA 1992	1	Assumption	
	EF	Exposure Frequency	days/year	350	USEPA 1995	234	USEPA 1993	
	ED	Exposure Duration	years	24 / 6	USEPA 1995	7 / 2	USEPA 1993	
	CF1	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	BW	Body Weight	kg	70 / 15	USEPA 1991	70 / 15	USEPA 1991	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760 / 2,190	USEPA 1989	2,555 / 730	USEPA 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical specific	(¹)	chemical specific	(¹)	DERMAL: $\text{Intake} = \text{CS} \times \text{AF} \times \text{SA} \times \text{ABS} \times \text{EF} \times \text{ED} \times \text{CF}$ $\text{BW} \times \text{AT}$
	CF	Conversion Factor	kg/mg	10 ⁻⁶		10 ⁻⁶		
	SA	Skin Surface Area Available for Contact (adult)	cm ²	5,750	USEPA 1992	5,000	USEPA 1992a	
	SA soil/adj	Skin Surface Area Available for Contact (child)	cm ² -year/kg	766	GIR, ABB January 1998	683	GIR, ABB January 1998	
	AF	Adherence Factor	mg/cm ²	1	USEPA 1992	0.2	USEPA 1993	
	ABS	Absorption Factor	unitless	chemical specific	see Text	chemical specific	see Text	
	EF	Exposure Frequency	days/year	350	USEPA 1995	234	USEPA 1993	
	ED	Exposure Duration	years	24 / 6	USEPA 1995	7 / 2	USEPA 1993	
	BW	Body Weight	kg	70 / 15	USEPA 1991	70 / 15	USEPA 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA 1989	25,550	USEPA 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760 / 2,190	USEPA 1989	2,555 / 730	USEPA 1989	

(¹) See Tables 6-12 through 6-22 of text.

References:

USEPA 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002.

USEPA 1991, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Parameters".

USEPA 1992a, "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

USEPA 1993, "Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure".

USEPA 1995, "USEPA Region IV Guidance Bulletin No. 3, November".

ABB, 1998, "Remedial Investigation and Feasibility Study, General Information Report (GIR), January".

APPENDIX D2
REPRESENTATIVE CONCENTRATION DATA

Site 3 Subsurface Soil UCLs

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	W NORMAL	W LOGNORMAL	W TEST	UCL NORM	UCL LOG	DIST	DETECTS - MAX	REP CONC
ACETONE	µg/kg	9.0000	15.0000	21.8867	0.6768	0.8885	0.8810	34.1861	49.2679	L	90.0000	49.2679
TETRACHLOROETHENE	µg/kg	1.0000	15.0000	5.6000	0.6257	0.5414	0.8810	5.9564	6.1172	U	3.0000	3.0000
4,4'-DDD	µg/kg	1.0000	15.0000	2.2867	0.4630	0.4893	0.8810	2.7703	2.6933	U	5.0000	2.6933
4,4'-DDT	µg/kg	1.0000	15.0000	2.2867	0.4630	0.4893	0.8810	2.7703	2.6933	U	5.0000	2.6933
DIELDRIN	µg/kg	1.0000	15.0000	3.4933	0.2916	0.3199	0.8810	6.3245	4.2721	U	26.0000	4.2721
ALUMINUM	mg/kg	15.0000	15.0000	21522.3333	0.9196	0.9514	0.8810	28623.4451	43810.3889	L	59600.0000	43810.3889
ARSENIC	mg/kg	15.0000	15.0000	3.3378	0.6717	0.9297	0.8810	5.2245	6.6023	L	16.0000	6.6023
BARIUM	mg/kg	15.0000	15.0000	7.2233	0.9357	0.9524	0.8810	9.1954	11.4791	L	16.4000	11.4791
BERYLLIUM	mg/kg	3.0000	15.0000	0.0597	0.8102	0.8723	0.8810	0.0710	0.0737	U	0.1300	0.0737
CADMIUM	mg/kg	6.0000	15.0000	0.3927	0.9242	0.8594	0.8810	0.4735	0.5479	N	0.7900	0.4735
CALCIUM	mg/kg	13.0000	15.0000	181.0433	0.9092	0.7176	0.8810	235.1545	1663.1804	N	429.0000	235.1545
CHROMIUM	mg/kg	15.0000	15.0000	22.0233	0.9172	0.8999	0.8810	27.2763	34.3410	N	37.9000	27.2763
COBALT	mg/kg	5.0000	15.0000	1.1343	0.7290	0.8285	0.8810	1.5369	1.7284	U	3.2000	1.7284
COPPER	mg/kg	14.0000	15.0000	5.2390	0.9684	0.8086	0.8810	6.6668	14.8937	N	11.1000	6.6668
CYANIDE	mg/kg	8.0000	15.0000	0.3460	0.6846	0.8220	0.8810	0.5248	0.7173	U	1.5600	0.7173
IRON	mg/kg	15.0000	15.0000	18101.6667	0.9154	0.9244	0.8810	22306.6854	26016.4748	L	32600.0000	26016.4748
LEAD	mg/kg	15.0000	15.0000	3.2747	0.9541	0.9514	0.8810	3.9002	4.2720	N	6.6000	3.9002
MAGNESIUM	mg/kg	15.0000	15.0000	86.1533	0.8275	0.9924	0.8810	114.0447	130.3793	L	265.0000	130.3793
MANGANESE	mg/kg	15.0000	15.0000	14.2267	0.8518	0.9731	0.8810	18.3197	20.4276	L	39.4000	20.4276
MERCURY	mg/kg	10.0000	15.0000	0.0367	0.8825	0.9396	0.8810	0.0483	0.0592	L	0.1000	0.0592
NICKEL	mg/kg	8.0000	15.0000	2.2033	0.8934	0.9483	0.8810	2.7760	3.0744	L	5.0000	3.0744
POTASSIUM	mg/kg	13.0000	15.0000	111.0067	0.9243	0.9213	0.8810	132.2824	142.5820	N	190.0000	132.2824
SELENIUM	mg/kg	9.0000	15.0000	1.0227	0.7318	0.8954	0.8810	1.6649	7.0398	L	4.9000	4.9000
SILVER	mg/kg	3.0000	15.0000	0.5130	0.5239	0.5946	0.8810	0.7863	0.7586	U	2.1000	2.1000
SODIUM	mg/kg	10.0000	15.0000	117.7133	0.7397	0.6922	0.8810	160.6373	1207.7324	U	217.0000	217.0000
VANADIUM	mg/kg	15.0000	15.0000	46.6433	0.9342	0.9356	0.8810	56.1275	62.8700	L	77.2000	62.8700
ZINC	mg/kg	12.0000	15.0000	4.6487	0.9487	0.7696	0.8810	6.1727	31.4902	N	11.1000	6.1727
TOTAL PETROLEUM HYDROCARBONS	mg/kg	2.0000	15.0000	2.2533	0.3752	0.4368	0.8810	4.1164	3.1099	U	16.6000	3.1099

Site 4 Surface Soil UCLs

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	W NORMAL	W LOGNORMAL	W TEST	UCL NORM	UCL LOG	DIST	DETECTS - MAX	REP CONC
ACETONE	µg/kg	5.0000	11.0000	101.6818	0.3943	0.7440	0.8500	261.3930	1184.8692	U	980.0000	980.0000
CARBON DISULFIDE	µg/kg	1.0000	11.0000	2.4545	0.6063	0.5199	0.8500	2.7399	2.9823	U	1.0000	1.0000
ETHYLBENZENE	µg/kg	1.0000	11.0000	2.5455	0.7244	0.7224	0.8500	2.6928	2.7062	U	2.0000	2.0000
TOLUENE	µg/kg	2.0000	11.0000	3.2273	0.4997	0.6905	0.8500	4.6843	4.6790	U	11.0000	4.6790
XYLENES, TOTAL	µg/kg	3.0000	11.0000	2.5909	0.7244	0.7807	0.8500	2.8856	2.8924	U	4.0000	2.8924
ANTHRACENE	µg/kg	1.0000	11.0000	170.2727	0.4782	0.4234	0.8500	190.8373	215.9231	U	58.0000	58.0000
BENZO(A)ANTHRACENE	µg/kg	2.0000	11.0000	160.1818	0.6120	0.5700	0.8500	186.1657	221.7843	U	84.0000	84.0000
BENZO(A)PYRENE	µg/kg	3.0000	11.0000	51.6364	0.8123	0.7434	0.8500	60.2411	66.6962	U	80.0000	66.6962
BIS(2-ETHYLHEXYL)PHTHALATE	µg/kg	7.0000	11.0000	134.7273	0.8926	0.8544	0.8500	172.8663	231.0636	N	250.0000	172.8663
CHRYSENE	µg/kg	2.0000	11.0000	166.6364	0.6505	0.6186	0.8500	184.5947	193.6083	U	110.0000	110.0000
DI-N-BUTYL PHTHALATE	µg/kg	1.0000	11.0000	168.7273	0.4452	0.3938	0.8500	192.9383	247.4821	U	36.0000	36.0000
DI-N-OCTYL PHTHALATE	µg/kg	1.0000	11.0000	169.3636	0.4682	0.4122	0.8500	191.5591	226.4675	U	48.0000	48.0000
DIBENZO(A,H)ANTHRACENE	µg/kg	3.0000	11.0000	44.0909	0.8820	0.6031	0.8500	54.9146	101.8836	U	31.0000	31.0000
FLUORANTHENE	µg/kg	3.0000	11.0000	151.5455	0.6817	0.6669	0.8500	179.0218	204.9747	U	80.0000	80.0000
N-NITROSO-DI-N-PROPYLAMINE	µg/kg	1.0000	11.0000	10.9091	0.7181	0.7102	0.8500	11.1142	11.8931	U	10.0000	10.0000
PHENANTHRENE	µg/kg	1.0000	11.0000	171.8182	0.4992	0.4463	0.8500	189.6171	204.2811	U	75.0000	75.0000
PYRENE	µg/kg	3.0000	11.0000	149.5455	0.6687	0.6529	0.8500	178.8175	211.2136	U	73.0000	73.0000
4,4'-DDE	µg/kg	3.0000	11.0000	7.4000	0.3474	0.3682	0.8500	17.4748	12.9080	U	63.0000	12.9080
4,4'-DDT	µg/kg	3.0000	11.0000	5.0818	0.3736	0.4696	0.8500	10.6920	8.5633	U	38.0000	8.5633
DIELDRIN	µg/kg	4.0000	11.0000	15.8527	0.5826	0.7788	0.8500	31.3541	160.7269	U	85.0000	85.0000
ALUMINUM	mg/kg	11.0000	11.0000	13549.0909	0.7662	0.8454	0.8500	17687.9381	18920.1360	U	27800.0000	18920.1360
ARSENIC	mg/kg	9.0000	11.0000	2.4282	0.8162	0.8880	0.8500	3.2930	3.7997	L	5.5000	3.7997
BARIUM	mg/kg	11.0000	11.0000	11.3682	0.9670	0.9367	0.8500	13.1887	14.0292	N	16.1000	13.1887
CALCIUM	mg/kg	7.0000	11.0000	3638.1818	0.3530	0.6040	0.8500	9864.8502	13417.0687	U	38000.0000	13417.0687
CHROMIUM	mg/kg	11.0000	11.0000	10.5318	0.7486	0.8685	0.8500	13.6093	14.2858	L	21.6000	14.2858
COBALT	mg/kg	3.0000	11.0000	0.5282	0.6161	0.5331	0.8500	0.5838	0.6240	U	0.6500	0.6240
COPPER	mg/kg	11.0000	11.0000	4.7591	0.9411	0.9739	0.8500	5.7265	6.0710	L	8.1000	6.0710
IRON	mg/kg	11.0000	11.0000	6978.6364	0.7359	0.8127	0.8500	9152.1501	9670.7947	U	14800.0000	9670.7947
LEAD	mg/kg	11.0000	11.0000	8.6318	0.8250	0.9131	0.8500	11.7847	13.9687	L	19.2000	13.9687
MAGNESIUM	mg/kg	10.0000	11.0000	214.2955	0.6006	0.9032	0.8500	329.3726	350.3027	L	827.0000	350.3027
MANGANESE	mg/kg	11.0000	11.0000	78.1773	0.9225	0.8935	0.8500	102.8670	136.9467	N	161.0000	102.8670
MERCURY	mg/kg	1.0000	11.0000	0.0173	0.5738	0.8023	0.8500	0.0198	0.0197	U	0.0300	0.0197
NICKEL	mg/kg	11.0000	11.0000	2.0227	0.9098	0.9271	0.8500	2.3979	2.5078	L	3.3000	2.5078
POTASSIUM	mg/kg	10.0000	10.0000	119.8250	0.9408	0.8987	0.8420	139.5049	150.6233	N	160.0000	139.5049
VANADIUM	mg/kg	11.0000	11.0000	19.3818	0.7626	0.8581	0.8500	25.3789	26.8985	L	41.4000	26.8985
ZINC	mg/kg	11.0000	11.0000	7.8318	0.7076	0.8391	0.8500	9.6415	9.6249	U	16.9000	9.6249
TOTAL PETROLEUM HYDROCARBONS	mg/kg	5.0000	6.0000	7.7350	0.9855	0.9749	0.7880	9.5778	10.6169	N	11.2000	9.5778
TPH (C8-C40)	mg/kg	3.0000	5.0000	39.7860	0.6055	0.8120	0.7620	107.2035	8146.6722	L	166.0000	166.0000
Associated Samples:												
W04SB00101	W04SB00601	W04SB01101										
W04SB00201	W04SB00701											
W04SB00301	W04SB00801											
W04SB00401-AVG	W04SB00901											
W04SB00501	W04SB01001											

Site 30 Subsurface Soil UCLs

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	W NORM	W LOG	W TEST	UCL NORM	UCL LOG	DETECTS - MAX	DIST	REP CONC
1,2-DICHLOROETHENE (TOTAL)	µg/kg	1.0000	25.0000	170.0400	0.2324	0.5074	0.9180	429.6639	83.2767	310.0000	U	83.2767
2-BUTANONE	µg/kg	3.0000	21.0000	187.5952	0.2289	0.3482	0.9080	499.1709	68.8124	10.0000	U	10.0000
ACETONE	µg/kg	11.0000	25.0000	241.3700	0.3429	0.8638	0.9180	503.4473	705.9067	690.0000	U	690.0000
ETHYLBENZENE	µg/kg	2.0000	25.0000	158.0800	0.2093	0.4484	0.9180	417.7238	44.3412	9.0000	U	9.0000
METHYLENE CHLORIDE	µg/kg	4.0000	25.0000	157.5300	0.2080	0.4143	0.9180	417.2085	40.4006	10.0000	U	10.0000
TOLUENE	µg/kg	1.0000	25.0000	158.4400	0.2100	0.4664	0.9180	418.0598	46.9547	20.0000	U	20.0000
TRICHLOROETHENE	µg/kg	4.0000	25.0000	165.9600	0.2247	0.7206	0.9180	425.2649	109.0487	160.0000	U	109.0487
XYLENES, TOTAL	µg/kg	1.0000	25.0000	159.3200	0.2116	0.4880	0.9180	418.8869	52.0619	42.0000	U	42.0000
2-METHYLNAPHTHALENE	µg/kg	5.0000	25.0000	285.1800	0.3760	0.6152	0.9180	415.5176	343.3545	270.0000	U	270.0000
4-METHYLPHENOL	µg/kg	1.0000	25.0000	347.4600	0.5027	0.6541	0.9180	492.4997	455.8437	44.0000	U	44.0000
BENZO(A)PYRENE	µg/kg	1.0000	25.0000	326.3800	0.5556	0.8045	0.9180	475.1535	489.4508	47.0000	U	47.0000
BENZO(B)FLUORANTHENE	µg/kg	1.0000	25.0000	348.1800	0.4984	0.6372	0.9180	493.0411	444.1370	62.0000	U	62.0000
BENZO(G,H,I)PERYLENE	µg/kg	2.0000	25.0000	344.0800	0.5115	0.6835	0.9180	489.6265	444.0025	92.0000	U	92.0000
BIS(2-ETHYLHEXYL)PHTHALATE	µg/kg	5.0000	25.0000	923.5400	0.2622	0.7352	0.9180	2002.9363	992.9683	16000.0000	U	992.9683
DIMETHYL PHTHALATE	µg/kg	1.0000	25.0000	328.3000	0.4215	0.4999	0.9180	465.7819	387.8334	330.0000	U	330.0000
INDENO(1,2,3-CD)PYRENE	µg/kg	1.0000	25.0000	348.5400	0.4963	0.6277	0.9180	493.3156	440.6019	71.0000	U	71.0000
N-NITROSODIPHENYLAMINE	µg/kg	1.0000	25.0000	373.9000	0.5222	0.5743	0.9180	519.3340	472.3333	710.0000	U	472.3333
NAPHTHALENE	µg/kg	4.0000	25.0000	1046.7400	0.2342	0.5489	0.9180	2399.9742	793.4254	20000.0000	U	793.4254
PHENANTHRENE	µg/kg	1.0000	25.0000	302.3000	0.4819	0.5109	0.9180	394.3670	365.4519	680.0000	U	365.4519
4,4'-DDD	µg/kg	1.0000	13.0000	2.2404	0.3741	0.4338	0.8660	2.8447	2.6612	6.3000	U	2.6612
ALUMINUM	mg/kg	13.0000	13.0000	11453.6462	0.7620	0.9530	0.8660	18075.2050	61403.6800	41800.0000	L	41800.0000
ARSENIC	mg/kg	13.0000	13.0000	3.1592	0.8336	0.9393	0.8660	4.4358	5.9195	8.6000	L	5.9195
BARIUM	mg/kg	12.0000	13.0000	6.0831	0.8526	0.9400	0.8660	8.7965	21.3066	17.1000	L	17.1000
CADMIUM	mg/kg	2.0000	13.0000	0.3354	0.7993	0.7572	0.8660	0.4212	0.5397	0.5750	U	0.5397
CALCIUM	mg/kg	9.0000	13.0000	195.8538	0.7483	0.9355	0.8660	308.5392	1041.3321	787.0000	L	787.0000
CHROMIUM	mg/kg	13.0000	13.0000	12.5677	0.8776	0.9468	0.8660	17.7616	35.1190	37.8000	L	35.1190
COBALT	mg/kg	5.0000	13.0000	0.8362	0.8248	0.8597	0.8660	1.2047	1.9009	2.3000	U	1.9009
COPPER	mg/kg	10.0000	13.0000	2.8181	0.8454	0.9109	0.8660	4.2582	15.0573	9.1000	L	9.1000
CYANIDE	mg/kg	6.0000	9.0000	0.3522	0.7540	0.7014	0.8290	0.4796	0.9876	0.5300	U	0.5300
IRON	mg/kg	13.0000	13.0000	11363.0769	0.9527	0.8740	0.8660	15039.8786	28765.6504	24500.0000	N	15039.8786
LEAD	mg/kg	13.0000	13.0000	6.0300	0.7815	0.9585	0.8660	8.7971	13.1952	22.0000	L	13.1952
MAGNESIUM	mg/kg	11.0000	13.0000	62.3077	0.8763	0.9582	0.8660	90.4065	221.1093	185.5000	L	185.5000
MANGANESE	mg/kg	13.0000	13.0000	38.6631	0.7271	0.9716	0.8660	65.2774	524.2893	177.0000	L	177.0000
MERCURY	mg/kg	5.0000	13.0000	0.0204	0.8148	0.9015	0.8660	0.0260	0.0276	0.0450	L	0.0276
NICKEL	mg/kg	4.0000	13.0000	1.4342	0.8945	0.8605	0.8660	1.8334	2.5273	3.3000	N	1.8334
POTASSIUM	mg/kg	5.0000	11.0000	71.8182	0.8528	0.8511	0.8500	98.5240	175.2181	193.0000	N	98.5240
SELENIUM	mg/kg	5.0000	13.0000	0.6623	0.6577	0.9408	0.8660	1.0902	1.6331	3.1000	L	1.6331
SILVER	mg/kg	4.0000	13.0000	0.3581	0.7914	0.9100	0.8660	0.4955	0.5890	0.9400	L	0.5890
SODIUM	mg/kg	4.0000	13.0000	57.6731	0.6507	0.8003	0.8660	98.1267	272.7065	214.0000	U	214.0000
VANADIUM	mg/kg	13.0000	13.0000	30.6385	0.9599	0.9064	0.8660	39.3026	53.9502	63.5000	N	39.3026
ZINC	mg/kg	10.0000	13.0000	2.1808	0.7830	0.9504	0.8660	3.3694	7.9065	7.2500	L	7.2500
TOTAL PETROLEUM HYDROCARBONS	mg/kg	14.0000	21.0000	1376.4190	0.3275	0.9435	0.9080	3140.6000	33638.8825	21200.0000	L	21200.0000
TOC	mg/kg	6.0000	6.0000	874.6667	0.8815	0.9485	0.7880	1338.5833	2449.9319	1890.0000	L	1890.0000
TPH (C8-C40)	mg/kg	1.0000	4.0000	6.4625	0.6788	0.7096	0.7480	10.6545	21.5771	11.8000	U	11.8000

Site 32 Subsurface Soil UCLs

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	W NORM	W LOG	W TEST	UCL NORM	UCL LOG	DETECTS - MAX	DIST	REP CONC
1,2-DICHLOROETHENE (TOTAL)	µg/kg	2.0000	22.0000	225.8750	0.6507	0.7346	0.9110	364.6879	3746.0637	430.0000	U	430.0000
2-BUTANONE	µg/kg	4.0000	19.0000	332.5000	0.6926	0.7044	0.9010	524.7122	17987.1171	8.0000	U	8.0000
ACETONE	µg/kg	13.0000	22.0000	522.8636	0.7012	0.8899	0.9110	801.9555	22315.3315	2100.0000	U	2100.0000
ETHYLBENZENE	µg/kg	4.0000	22.0000	584.9659	0.5157	0.7457	0.9110	1062.7174	22071.2197	5000.0000	U	5000.0000
METHYLENE CHLORIDE	µg/kg	5.0000	22.0000	158.8705	0.5384	0.7624	0.9110	281.2564	1109.7904	610.0000	U	610.0000
TETRACHLOROETHENE	µg/kg	2.0000	22.0000	309.7386	0.6585	0.7163	0.9110	490.2595	8582.6119	1400.0000	U	1400.0000
TOLUENE	µg/kg	3.0000	22.0000	1099.9659	0.4148	0.7538	0.9110	2207.6083	43546.7607	12000.0000	U	12000.0000
XYLENES, TOTAL	µg/kg	4.0000	22.0000	2906.7841	0.3926	0.7482	0.9110	5988.3587	265897.2268	32000.0000	U	32000.0000
2-METHYLNAPHTHALENE	µg/kg	8.0000	22.0000	6536.0000	0.5705	0.7236	0.9110	11172.7188	59653.9880	40000.0000	U	40000.0000
BIS(2-ETHYLHEXYL)PHTHALATE	µg/kg	3.0000	22.0000	1235.0000	0.5523	0.6953	0.9110	1953.8156	3067.7750	590.0000	U	590.0000
CARBAZOLE	µg/kg	1.0000	22.0000	1291.5455	0.5796	0.6931	0.9110	2008.5630	3580.5267	39.0000	U	39.0000
DI-N-OCTYL PHTHALATE	µg/kg	1.0000	22.0000	1291.5909	0.5795	0.6920	0.9110	2008.5973	3566.4655	40.0000	U	40.0000
DIBENZOFURAN	µg/kg	2.0000	22.0000	1000.4545	0.5549	0.6233	0.9110	1591.3435	1901.3927	1500.0000	U	1500.0000
FLUORANTHENE	µg/kg	1.0000	22.0000	1291.7727	0.5795	0.6923	0.9110	2008.7407	3576.2462	39.0000	U	39.0000
FLUORENE	µg/kg	1.0000	22.0000	1126.3638	0.5536	0.6096	0.9110	1783.6614	2300.5671	970.0000	U	970.0000
NAPHTHALENE	µg/kg	7.0000	22.0000	4155.6818	0.5984	0.6589	0.9110	6905.9031	23050.0312	24000.0000	U	23050.0312
PHENANTHRENE	µg/kg	1.0000	22.0000	1292.4545	0.5784	0.6731	0.9110	2009.2498	3379.5654	59.0000	U	59.0000
ALUMINUM	mg/kg	16.0000	16.0000	10210.0000	0.8029	0.9819	0.8870	13979.5326	17026.0360	33200.0000	L	17026.0360
ARSENIC	mg/kg	12.0000	16.0000	1.4294	0.9372	0.9681	0.8870	1.8064	2.2151	3.3000	L	2.2151
BARIUM	mg/kg	16.0000	16.0000	10.6375	0.9348	0.9222	0.8870	12.6308	13.8599	18.7000	N	12.6308
BERYLLIUM	mg/kg	4.0000	16.0000	0.1022	0.7987	0.9273	0.8870	0.1384	0.1591	0.2100	L	0.1591
CADMIUM	mg/kg	1.0000	16.0000	0.3086	0.7308	0.7281	0.8870	0.3766	0.4369	0.4400	U	0.4369
CALCIUM	mg/kg	14.0000	16.0000	165.3688	0.8321	0.9467	0.8870	217.5338	330.8592	418.5000	L	330.8592
CHROMIUM	mg/kg	22.0000	22.0000	10.2841	0.9092	0.9459	0.9110	12.6161	14.8899	26.3000	L	14.8899
COBALT	mg/kg	7.0000	16.0000	0.7616	0.7173	0.9012	0.8870	1.0038	1.0629	2.5000	L	1.0629
COPPER	mg/kg	16.0000	16.0000	3.4019	0.9127	0.9506	0.8870	4.4122	5.7699	8.4000	L	5.7699
CYANIDE	mg/kg	7.0000	13.0000	0.3142	0.7423	0.7122	0.8680	0.4248	0.7121	0.5600	U	0.5600
IRON	mg/kg	16.0000	16.0000	6267.3750	0.9309	0.8742	0.8870	7978.9694	11618.2542	16000.0000	N	7978.9694
LEAD	mg/kg	16.0000	16.0000	3.0875	0.9122	0.8877	0.8870	3.3499	3.4136	3.8000	N	3.3499
MAGNESIUM	mg/kg	16.0000	16.0000	128.6188	0.8998	0.9372	0.8870	162.5339	186.3173	284.0000	L	186.3173
MANGANESE	mg/kg	16.0000	16.0000	23.0594	0.9311	0.9515	0.8870	29.7946	40.4870	53.5000	L	40.4870
MERCURY	mg/kg	9.0000	16.0000	0.0234	0.8809	0.8895	0.8870	0.0280	0.0305	0.0400	L	0.0305
NICKEL	mg/kg	10.0000	16.0000	2.2594	0.8618	0.9505	0.8870	2.7452	2.8718	4.7000	L	2.8718
POTASSIUM	mg/kg	14.0000	16.0000	251.8250	0.8945	0.9577	0.8870	333.0651	428.4546	672.0000	L	428.4546
SELENIUM	mg/kg	7.0000	16.0000	0.5413	0.7835	0.9521	0.8870	0.8073	1.4579	2.2000	L	1.4579
SILVER	mg/kg	3.0000	16.0000	0.3584	0.6647	0.7986	0.8870	0.4691	0.4735	0.9600	U	0.4735
SODIUM	mg/kg	11.0000	16.0000	99.2969	0.8162	0.8930	0.8870	138.8907	343.1957	235.0000	L	235.0000
VANADIUM	mg/kg	16.0000	16.0000	19.2781	0.8962	0.9892	0.8870	24.2360	27.5636	43.1000	L	27.5636
ZINC	mg/kg	14.0000	16.0000	4.5563	0.9543	0.8257	0.8870	5.7970	12.7478	9.1000	N	5.7970
TOTAL PETROLEUM HYDROCARBONS	mg/kg	6.0000	13.0000	205.4346	0.3677	0.7946	0.8660	519.3002	24777.5450	2310.0000	U	2310.0000
TPH (C8-C40)	mg/kg	3.0000	3.0000	17.5867	0.8031	0.7849	0.7670	30.7925	295.7124	22.6000	N	22.6000

site 33 subsurface soil

PARAMETER	UNITS	# DETECTS	COUNT	AVG	STANDARD DEVIATION	W NORM	W LOG	W TEST	UCL NORM	UCL LOG	DIST	DETECTS - MAX	REP CONC
1,2-DICHLOROETHENE (TOTAL)	µg/kg	2.0000	19.0000	78.1579	219.1369	0.3647	0.4746	0.9010	165.3321	108.4277	U	4.0000	4.0000
ACETONE	µg/kg	5.0000	19.0000	78.9474	218.8751	0.3691	0.5268	0.9010	166.0174	114.9902	U	17.0000	17.0000
ETHYLBENZENE	µg/kg	1.0000	19.0000	120.5000	370.0299	0.3625	0.4497	0.9010	267.7004	163.4251	U	1500.0000	1500.0000
METHYLENE CHLORIDE	µg/kg	4.0000	19.0000	78.4474	219.0471	0.3713	0.6927	0.9010	165.5858	158.7989	U	2.0000	2.0000
TRICHLOROETHENE	µg/kg	2.0000	19.0000	78.5395	219.0037	0.3653	0.4752	0.9010	165.6606	108.1437	U	9.2500	9.2500
XYLENES, TOTAL	µg/kg	2.0000	19.0000	277.3421	1098.5705	0.2715	0.4475	0.9010	714.3810	262.2413	U	4800.0000	4800.0000
2-METHYLNAPHTHALENE	µg/kg	2.0000	19.0000	283.9474	439.8219	0.2540	0.2888	0.9010	458.9115	320.4468	U	2100.0000	320.4468
BIS(2-ETHYLHEXYL)PHTHALATE	µg/kg	2.0000	19.0000	190.5789	60.3852	0.4788	0.5010	0.9010	214.6008	221.0911	U	410.0000	221.0911
FLUORENE	µg/kg	1.0000	19.0000	183.1579	8.8523	0.6078	0.5758	0.9010	186.6794	207.1222	U	150.0000	150.0000
NAPHTHALENE	µg/kg	3.0000	19.0000	219.4737	104.2019	0.4197	0.4731	0.9010	260.9259	248.4605	U	610.0000	248.4605
PHENANTHRENE	µg/kg	2.0000	19.0000	181.7895	30.3087	0.5175	0.4204	0.9010	193.8465	202.7025	U	240.0000	202.7025
PYRENE	µg/kg	1.0000	19.0000	177.3684	33.4734	0.3346	0.2894	0.9010	190.8844	212.3298	U	40.0000	40.0000
ALPHA-CHLORDANE	µg/kg	2.0000	13.0000	4.9038	13.5653	0.3334	0.4472	0.8660	11.6083	7.2708	U	50.0000	7.2708
DIELDRIN	µg/kg	1.0000	13.0000	2.7038	3.0938	0.3197	0.3378	0.8660	4.2329	3.4881	U	13.0000	3.4881
GAMMA-CHLORDANE	µg/kg	2.0000	13.0000	7.0885	21.0314	0.3334	0.4566	0.8660	17.4830	11.2770	U	77.0000	11.2770
HEPTACHLOR	µg/kg	1.0000	13.0000	1.1462	0.7078	0.3442	0.3799	0.8660	1.4960	1.3787	U	3.5000	1.3787
ALUMINUM	mg/kg	13.0000	13.0000	22671.5385	13806.8647	0.9148	0.9160	0.8660	29495.4140	38366.5284	L	47800.0000	38366.5284
ARSENIC	mg/kg	13.0000	13.0000	3.5854	2.9657	0.8381	0.9488	0.8660	5.0311	7.2742	L	11.5000	7.2742
BARIUM	mg/kg	13.0000	13.0000	9.9231	3.8204	0.9387	0.9028	0.8660	11.8113	13.3001	N	14.9000	11.8113
BERYLLIUM	mg/kg	1.0000	13.0000	0.1042	0.1045	0.5246	0.5653	0.8660	0.1559	0.1581	U	0.1300	0.1581
CADMIUM	mg/kg	11.0000	13.0000	0.6123	0.2074	0.9630	0.9535	0.8660	0.7148	0.7537	N	1.0000	0.7148
CALCIUM	mg/kg	11.0000	13.0000	383.8077	198.1274	0.9402	0.9147	0.8660	481.7288	594.6109	N	691.0000	481.7288
CHROMIUM	mg/kg	13.0000	13.0000	17.9154	9.2263	0.9255	0.9193	0.8660	22.4754	28.1358	N	34.7000	22.4754
COBALT	mg/kg	6.0000	13.0000	1.0346	0.4892	0.8098	0.8110	0.8660	1.2784	1.3870	U	1.8000	1.3870
COPPER	mg/kg	13.0000	13.0000	5.7923	2.5860	0.9196	0.9114	0.8660	7.0704	7.7343	N	11.1000	7.0704
IRON	mg/kg	13.0000	13.0000	12753.8462	5630.8210	0.9175	0.8978	0.8660	15536.7123	17297.0012	N	22300.0000	15536.7123
LEAD	mg/kg	19.0000	19.0000	8.1526	6.0680	0.7671	0.9422	0.9010	10.5685	11.0395	L	24.3000	11.0395
MAGNESIUM	mg/kg	13.0000	13.0000	105.2846	38.2899	0.9743	0.9354	0.8660	124.2089	138.3178	N	170.0000	124.2089
MANGANESE	mg/kg	13.0000	13.0000	66.0846	42.0264	0.8551	0.9460	0.8660	86.8558	97.1899	L	169.0000	97.1899
MERCURY	mg/kg	7.0000	13.0000	0.0281	0.0135	0.8446	0.8385	0.8660	0.0347	0.0381	U	0.0500	0.0381
NICKEL	mg/kg	6.0000	13.0000	1.8731	1.1921	0.7793	0.7488	0.8660	2.4623	2.9653	U	3.8000	2.9653
POTASSIUM	mg/kg	11.0000	13.0000	110.9423	48.2320	0.9595	0.9666	0.8660	134.7804	148.1892	L	205.0000	148.1892
SELENIUM	mg/kg	4.0000	13.0000	0.2715	0.2472	0.7441	0.6961	0.8660	0.3937	0.6628	U	0.6400	0.6400
SODIUM	mg/kg	11.0000	13.0000	173.1538	60.2880	0.8747	0.7347	0.8660	202.9505	240.3453	N	249.0000	202.9505
VANADIUM	mg/kg	13.0000	13.0000	33.7892	16.4658	0.8957	0.8722	0.8660	41.9072	47.9131	N	61.5000	41.9072
ZINC	mg/kg	13.0000	13.0000	8.2000	4.0990	0.7815	0.9234	0.8660	10.2259	10.4128	L	19.3000	10.4128
TOTAL PETROLEUM HYDROCARBONS	mg/kg	9.0000	17.0000	556.7324	1890.8897	0.3348	0.7975	0.8920	1357.4621	26471.8881	U	7790.0000	7790.0000
TOC	mg/kg	3.0000	3.0000	811.3333	101.7120	0.9095	0.9221	0.7670	982.8058	1042.8375	L	926.0000	926.0000

Associated Samples:

33B00102-AVG	33SB1-3-5(92)	33SB4-5-7(92)	33B00303	33SB3-4-6(92)
33B00103	33SB2-10-12(92)	33SB5-10-12(92)	33SB1-10-12(92)	33SB4-3-5(92)
33B00202	33SB2-2-4(92)	33SB5-5-7(92)		
33B00203	33SB2-5-7(92)	W33SB00801		
33B00302-AVG	33SB3-10-12(92)	W33SB01101		

APPENDIX D3

INTAKE AND RISK CALCULATIONS

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 3

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	4.8E-08	5.6E-07	1.60E+01	5.00E-05	7.7E-07	7.9%	1.1E-02	1.6%
Aluminum	21500	2.4E-02	2.7E-01	NA	1.00E+00	NA	NA	2.7E-01	39.7%
Arsenic	5.5	6.0E-06	7.0E-05	1.50E+00	3.00E-04	9.0E-06	92.1%	2.3E-01	33.9%
Chromium	42.7	4.7E-05	5.5E-04	NA	5.00E-03	NA	NA	1.1E-01	15.8%
Vanadium	34	3.7E-05	4.3E-04	NA	7.00E-03	NA	NA	6.2E-02	9.0%
					Total	9.8E-06	100.0%	6.9E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 2, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SAsoil/adj	766 Skin surface available for contact (cm ² -year/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	4.62E-09	5.39E-08	3.20E+01	2.50E-05	1.5E-07	2.1%	2.2E-03	0.7%
Aluminum	21500	0.001	2.26E-04	2.63E-03	NA	1.00E-01	NA	NA	2.6E-02	8.3%
Arsenic	5.5	0.032	1.85E-06	2.15E-05	3.66E+00	1.23E-04	6.8E-06	97.9%	1.8E-01	55.5%
Chromium	42.7	0.001	4.48E-07	5.23E-06	NA	1.00E-04	NA	NA	5.2E-02	16.6%
Vanadium	34	0.001	3.57E-07	4.16E-06	NA	7.00E-05	NA	NA	5.9E-02	18.9%
Total							6.9E-06	100.0%	3.2E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 2, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	7.7E-07	1.5E-07	9.2E-07	5.5%	1.1E-02	2.2E-03	1.3E-02	1.3%
Aluminum	NA	NA	NA	NA	2.7E-01	2.6E-02	3.0E-01	29.9%
Arsenic	9.0E-06	6.8E-06	1.6E-05	94.5%	2.3E-01	1.8E-01	4.1E-01	40.7%
Chromium	NA	NA	NA	NA	1.1E-01	5.2E-02	1.6E-01	16.0%
Vanadium	NA	NA	NA	NA	6.2E-02	5.9E-02	1.2E-01	12.1%
Total	9.8E-06	6.9E-06	1.7E-05	100.0%	6.9E-01	3.2E-01	1.0E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	1.4E-02	1.6E-01	NA	3.00E-01	NA	NA	5.5E-01	100.0%
					Total	NA	NA	5.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj= :	766 Skin surface available for contact (cm ² year/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	1.35E-04	1.58E-03	NA	4.50E-02	NA	NA	3.5E-02	100.0%
Total							NA	NA	3.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	5.5E-01	3.5E-02	5.8E-01	100.0%
Total	NA	NA	NA	NA	5.5E-01	3.5E-02	5.8E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	1.7E-09	6.0E-08	1.60E+01	5.00E-05	2.7E-08	6.0%	1.2E-03	1.1%
Aluminum	11161	1.4E-03	4.8E-02	NA	1.00E+00	NA	NA	4.8E-02	45.5%
Arsenic	2.34	2.9E-07	1.0E-05	1.50E+00	3.00E-04	4.3E-07	94.0%	3.3E-02	31.8%
Chromium	12.8	1.6E-06	5.5E-05	NA	5.00E-03	NA	NA	1.1E-02	10.4%
Vanadium	19	2.3E-06	8.1E-05	NA	7.00E-03	NA	NA	1.2E-02	11.1%
					Total	4.6E-07	100.0%	1.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	663 Skin surface available for contact (cm ² /event)
AF =	0.2 Soil to skin adherence factor (mg/cm ²)
ABS =	Absorption factor (unitless)
EF =	234 Exposure frequency (events/year)
ED =	Exposure duration (years)
BW =	Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	0.01	1.70E-10	5.95E-09	3.20E+01	2.50E-05	5.4E-09	1.6%	2.4E-04	0.5%
Aluminum	11161	0.001	1.36E-05	4.74E-04	NA	1.00E-01	NA	NA	4.7E-03	9.9%
Arsenic	2.34	0.032	9.09E-08	3.18E-06	3.66E+00	1.23E-04	3.3E-07	98.4%	2.6E-02	54.1%
Chromium	12.8	0.001	1.55E-08	5.44E-07	NA	1.00E-04	NA	NA	5.4E-03	11.4%
Vanadium	19	0.001	2.31E-08	8.08E-07	NA	7.00E-05	NA	NA	1.2E-02	24.1%
Total							3.4E-07	100.0%	4.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	2.7E-08	5.4E-09	3.3E-08	4.1%	1.2E-03	2.4E-04	1.4E-03	0.9%
Aluminum	NA	NA	NA	NA	4.8E-02	4.7E-03	5.2E-02	34.4%
Arsenic	4.3E-07	3.3E-07	7.6E-07	95.9%	3.3E-02	2.6E-02	5.9E-02	38.8%
Chromium	NA	NA	NA	NA	1.1E-02	5.4E-03	1.6E-02	10.7%
Vanadium	NA	NA	NA	NA	1.2E-02	1.2E-02	2.3E-02	15.2%
Total	4.6E-07	3.4E-07	7.9E-07	100.0%	1.0E-01	4.8E-02	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7269	8.9E-04	3.1E-02	NA	3.00E-01	NA	NA	1.0E-01	100.0%
					Total	NA	NA	1.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj= :	663 Skin surface available for contact (cm ² ·year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7269	0.001	8.83E-06	3.09E-04	NA	4.50E-02	NA	NA	6.9E-03	100.0%
Total						NA	NA	NA	6.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.0E-01	6.9E-03	1.1E-01	100.0%
Total	NA	NA	NA	NA	1.0E-01	6.9E-03	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	1.7E-09	1.2E-08	1.60E+01	5.00E-05	2.8E-08	7.9%	2.4E-04	1.6%
Aluminum	21500	8.4E-04	5.9E-03	NA	1.00E+00	NA	NA	5.9E-03	39.7%
Arsenic	5.5	2.2E-07	1.5E-06	1.50E+00	3.00E-04	3.2E-07	92.1%	5.0E-03	33.9%
Chromium	42.7	1.7E-06	1.2E-05	NA	5.00E-03	NA	NA	2.3E-03	15.8%
Vanadium	34	1.3E-06	9.3E-06	NA	7.00E-03	NA	NA	1.3E-03	9.0%
					Total	3.5E-07	100.0%	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	7.85E-10	5.50E-09	3.20E+01	2.50E-05	2.5E-08	2.1%	2.2E-04	0.7%
Aluminum	21500	0.001	3.84E-05	2.69E-04	NA	1.00E-01	NA	NA	2.7E-03	8.3%
Arsenic	5.5	0.032	3.14E-07	2.20E-06	3.66E+00	1.23E-04	1.1E-06	97.9%	1.8E-02	55.5%
Chromium	42.7	0.001	7.62E-08	5.33E-07	NA	1.00E-04	NA	NA	5.3E-03	16.6%
Vanadium	34	0.001	6.07E-08	4.25E-07	NA	7.00E-05	NA	NA	6.1E-03	18.9%
Total							1.2E-06	100.0%	3.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	2.8E-08	2.5E-08	5.3E-08	3.5%	2.4E-04	2.2E-04	4.6E-04	1.0%
Aluminum	NA	NA	NA	NA	5.9E-03	2.7E-03	8.6E-03	18.2%
Arsenic	3.2E-07	1.1E-06	1.5E-06	96.5%	5.0E-03	1.8E-02	2.3E-02	48.7%
Chromium	NA	NA	NA	NA	2.3E-03	5.3E-03	7.7E-03	16.3%
Vanadium	NA	NA	NA	NA	1.3E-03	6.1E-03	7.4E-03	15.7%
Total	3.5E-07	1.2E-06	1.5E-06	100.0%	1.5E-02	3.2E-02	4.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	5.0E-04	3.5E-03	NA	3.00E-01	NA	NA	1.2E-02	100.0%
					Total	NA	NA	1.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	2.30E-05	1.61E-04	NA	4.50E-02	NA	NA	3.6E-03	100.0%
						Total	NA	NA	3.6E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.2E-02	3.6E-03	1.5E-02	100.0%
Total	NA	NA	NA	NA	1.2E-02	3.6E-03	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	5.5E-11	1.9E-09	1.60E+01	5.00E-05	8.8E-10	6.0%	3.8E-05	1.1%
Aluminum	11161	4.4E-05	1.5E-03	NA	1.00E+00	NA	NA	1.5E-03	45.5%
Arsenic	2.34	9.2E-09	3.2E-07	1.50E+00	3.00E-04	1.4E-08	94.0%	1.1E-03	31.8%
Chromium	12.8	5.0E-08	1.8E-06	NA	5.00E-03	NA	NA	3.5E-04	10.4%
Vanadium	19	7.4E-08	2.6E-06	NA	7.00E-03	NA	NA	3.7E-04	11.1%
					Total	1.5E-08	100.0%	3.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.6E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	0.01	5.00E-11	1.75E-09	3.20E+01	2.50E-05	1.6E-09	1.6%	7.0E-05	0.5%
Aluminum	11161	0.001	3.98E-06	1.39E-04	NA	1.00E-01	NA	NA	1.4E-03	9.9%
Arsenic	2.34	0.032	2.67E-08	9.35E-07	3.66E+00	1.23E-04	9.8E-08	98.4%	7.6E-03	54.1%
Chromium	12.8	0.001	4.57E-09	1.60E-07	NA	1.00E-04	NA	NA	1.6E-03	11.4%
Vanadium	19	0.001	6.78E-09	2.37E-07	NA	7.00E-05	NA	NA	3.4E-03	24.1%
Total							9.9E-08	100.0%	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	8.8E-10	1.6E-09	2.5E-09	2.2%	3.8E-05	7.0E-05	1.1E-04	0.6%
Aluminum	NA	NA	NA	NA	1.5E-03	1.4E-03	2.9E-03	16.8%
Arsenic	1.4E-08	9.8E-08	1.1E-07	97.8%	1.1E-03	7.6E-03	8.7E-03	49.8%
Chromium	NA	NA	NA	NA	3.5E-04	1.6E-03	1.9E-03	11.2%
Vanadium	NA	NA	NA	NA	3.7E-04	3.4E-03	3.8E-03	21.6%
Total	1.5E-08	9.9E-08	1.1E-07	100.0%	3.4E-03	1.4E-02	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	2.2E-09	7.7E-09	1.60E+01	5.00E-05	3.5E-08	7.9%	1.5E-04	1.6%
Aluminum	21500	1.1E-03	3.8E-03	NA	1.00E+00	NA	NA	3.8E-03	39.7%
Arsenic	5.5	2.8E-07	9.7E-07	1.50E+00	3.00E-04	4.2E-07	92.1%	3.2E-03	33.9%
Chromium	42.7	2.1E-06	7.5E-06	NA	5.00E-03	NA	NA	1.5E-03	15.8%
Vanadium	34	1.7E-06	6.0E-06	NA	7.00E-03	NA	NA	8.6E-04	9.0%
					Total	4.5E-07	100.0%	9.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	1.27E-09	4.46E-09	3.20E+01	2.50E-05	4.1E-08	2.1%	1.8E-04	0.7%
Aluminum	21500	0.001	6.22E-05	2.18E-04	NA	1.00E-01	NA	NA	2.2E-03	8.3%
Arsenic	5.5	0.032	5.09E-07	1.78E-06	3.66E+00	1.23E-04	1.9E-06	97.9%	1.4E-02	55.5%
Chromium	42.7	0.001	1.24E-07	4.32E-07	NA	1.00E-04	NA	NA	4.3E-03	16.6%
Vanadium	34	0.001	9.84E-08	3.44E-07	NA	7.00E-05	NA	NA	4.9E-03	18.9%
Total							1.9E-06	100.0%	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 7, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	3.5E-08	4.1E-08	7.6E-08	3.2%	1.5E-04	1.8E-04	3.3E-04	0.9%
Aluminum	NA	NA	NA	NA	3.8E-03	2.2E-03	6.0E-03	16.7%
Arsenic	4.2E-07	1.9E-06	2.3E-06	96.8%	3.2E-03	1.4E-02	1.8E-02	49.7%
Chromium	NA	NA	NA	NA	1.5E-03	4.3E-03	5.8E-03	16.4%
Vanadium	NA	NA	NA	NA	8.6E-04	4.9E-03	5.8E-03	16.2%
Total	4.5E-07	1.9E-06	2.4E-06	100.0%	9.5E-03	2.6E-02	3.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	6.5E-04	2.3E-03	NA	3.00E-01	NA	NA	7.6E-03	100.0%
					Total	NA	NA	7.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	3.73E-05	1.31E-04	NA	4.50E-02	NA	NA	2.9E-03	100.0%
						Total	NA	NA	2.9E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	7.6E-03	2.9E-03	1.0E-02	100.0%
Total	NA	NA	NA	NA	7.6E-03	2.9E-03	1.0E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.8E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	1.2E-10	1.2E-09	1.60E+01	5.00E-05	2.0E-09	6.0%	2.5E-05	1.1%
Aluminum	11161	9.8E-05	9.8E-04	NA	1.00E+00	NA	NA	9.8E-04	45.5%
Arsenic	2.34	2.1E-08	2.1E-07	1.50E+00	3.00E-04	3.1E-08	94.0%	6.9E-04	31.8%
Chromium	12.8	1.1E-07	1.1E-06	NA	5.00E-03	NA	NA	2.3E-04	10.4%
Vanadium	19	1.7E-07	1.7E-06	NA	7.00E-03	NA	NA	2.4E-04	11.1%
Total						3.3E-08	100.0%	2.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day**

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	0.01	2.47E-11	2.47E-10	3.20E+01	2.50E-05	7.9E-10	1.6%	9.9E-06	0.5%
Aluminum	11161	0.001	1.97E-06	1.97E-05	NA	1.00E-01	NA	NA	2.0E-04	9.9%
Arsenic	2.34	0.032	1.32E-08	1.32E-07	3.66E+00	1.23E-04	4.8E-08	98.4%	1.1E-03	54.1%
Chromium	12.8	0.001	2.25E-09	2.25E-08	NA	1.00E-04	NA	NA	2.3E-04	11.4%
Vanadium	19	0.001	3.35E-09	3.35E-08	NA	7.00E-05	NA	NA	4.8E-04	24.1%
Total							4.9E-08	100.0%	2.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	2.0E-09	7.9E-10	2.8E-09	3.4%	2.5E-05	9.9E-06	3.5E-05	0.8%
Aluminum	NA	NA	NA	NA	9.8E-04	2.0E-04	1.2E-03	28.5%
Arsenic	3.1E-08	4.8E-08	7.9E-08	96.6%	6.9E-04	1.1E-03	1.8E-03	42.5%
Chromium	NA	NA	NA	NA	2.3E-04	2.3E-04	4.5E-04	10.9%
Vanadium	NA	NA	NA	NA	2.4E-04	4.8E-04	7.2E-04	17.3%
Total	3.3E-08	4.9E-08	8.2E-08	100.0%	2.2E-03	2.0E-03	4.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JUNE 30, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	7.7E-09	2.2E-08	1.60E+01	5.00E-05	1.2E-07	7.9%	4.3E-04	1.6%
Aluminum	21500	3.8E-03	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	39.7%
Arsenic	5.5	9.6E-07	2.7E-06	1.50E+00	3.00E-04	1.4E-06	92.1%	9.0E-03	33.9%
Chromium	42.7	7.5E-06	2.1E-05	NA	5.00E-03	NA	NA	4.2E-03	15.8%
Vanadium	34	5.9E-06	1.7E-05	NA	7.00E-03	NA	NA	2.4E-03	9.0%
					Total	1.6E-06	100.0%	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JUNE 30, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 3

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	3.54E-09	9.90E-09	3.20E+01	2.50E-05	1.1E-07	2.1%	4.0E-04	0.7%
Aluminum	21500	0.001	1.73E-04	4.84E-04	NA	1.00E-01	NA	NA	4.8E-03	8.3%
Arsenic	5.5	0.032	1.41E-06	3.96E-06	3.66E+00	1.23E-04	5.2E-06	97.9%	3.2E-02	55.5%
Chromium	42.7	0.001	3.43E-07	9.61E-07	NA	1.00E-04	NA	NA	9.6E-03	16.6%
Vanadium	34	0.001	2.73E-07	7.65E-07	NA	7.00E-05	NA	NA	1.1E-02	18.9%
Total							5.3E-06	100.0%	5.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JUNE 30, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.2E-07	1.1E-07	2.4E-07	3.4%	4.3E-04	4.0E-04	8.3E-04	1.0%
Aluminum	NA	NA	NA	NA	1.1E-02	4.8E-03	1.5E-02	18.2%
Arsenic	1.4E-06	5.2E-06	6.6E-06	96.6%	9.0E-03	3.2E-02	4.1E-02	48.8%
Chromium	NA	NA	NA	NA	4.2E-03	9.6E-03	1.4E-02	16.3%
Vanadium	NA	NA	NA	NA	2.4E-03	1.1E-02	1.3E-02	15.8%
Total	1.6E-06	5.3E-06	6.9E-06	100.0%	2.6E-02	5.8E-02	8.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	2.3E-03	6.3E-03	NA	3.00E-01	NA	NA	2.1E-02	100.0%
					Total	NA	NA	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	1.04E-04	2.90E-04	NA	4.50E-02	NA	NA	6.5E-03	100.0%
						Total	NA	NA	6.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.1E-02	6.5E-03	2.7E-02	100.0%
Total	NA	NA	NA	NA	2.1E-02	6.5E-03	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =:	Mean concentration in soil (mg/kg)
IR =:	50 Soil Ingestion Rate (mg/day)
CF =:	1.0E-06 Conversion Factor (kg/mg)
FI =:	1 Fraction from contaminated source (unitless)
EF =:	250 Exposure Frequency (days/year)
ED =:	9 Exposure Duration (years)
BW =:	70 Body Weight (kg)
ATc =:	25,550 Averaging time for carcinogenic exposures (days)
ATn =:	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 6.3E-08 kg-soil/kg-wt/day

Chronic Daily Intake =: 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	8.8E-10	6.8E-09	1.60E+01	5.00E-05	1.4E-08	6.0%	1.4E-04	1.1%
Aluminum	11161	7.0E-04	5.5E-03	NA	1.00E+00	NA	NA	5.5E-03	45.5%
Arsenic	2.34	1.5E-07	1.1E-06	1.50E+00	3.00E-04	2.2E-07	94.0%	3.8E-03	31.8%
Chromium	12.8	8.1E-07	6.3E-06	NA	5.00E-03	NA	NA	1.3E-03	10.4%
Vanadium	19	1.2E-06	9.3E-06	NA	7.00E-03	NA	NA	1.3E-03	11.1%
Total						2.3E-07	100.0%	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	0.01	8.10E-11	6.30E-10	3.20E+01	2.50E-05	2.6E-09	1.6%	2.5E-05	0.5%
Aluminum	11161	0.001	6.46E-06	5.02E-05	NA	1.00E-01	NA	NA	5.0E-04	9.9%
Arsenic	2.34	0.032	4.33E-08	3.37E-07	3.66E+00	1.23E-04	1.6E-07	98.4%	2.7E-03	54.1%
Chromium	12.8	0.001	7.41E-09	5.76E-08	NA	1.00E-04	NA	NA	5.8E-04	11.4%
Vanadium	19	0.001	1.10E-08	8.55E-08	NA	7.00E-05	NA	NA	1.2E-03	24.1%
Total							1.6E-07	100.0%	5.1E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.4E-08	2.6E-09	1.7E-08	4.2%	1.4E-04	2.5E-05	1.6E-04	1.0%
Aluminum	NA	NA	NA	NA	5.5E-03	5.0E-04	6.0E-03	35.0%
Arsenic	2.2E-07	1.6E-07	3.8E-07	95.8%	3.8E-03	2.7E-03	6.6E-03	38.4%
Chromium	NA	NA	NA	NA	1.3E-03	5.8E-04	1.8E-03	10.7%
Vanadium	NA	NA	NA	NA	1.3E-03	1.2E-03	2.5E-03	14.9%
Total	2.3E-07	1.6E-07	4.0E-07	100.0%	1.2E-02	6.1E-03	1.7E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.25 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 5.2E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.5E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 3

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	2.3E-10	6.5E-10	1.60E+01	5.00E-05	3.7E-09	7.9%	1.3E-05	1.6%
Aluminum	21500	1.1E-04	3.2E-04	NA	1.00E+00	NA	NA	3.2E-04	39.7%
Arsenic	5.5	2.9E-08	8.1E-08	1.50E+00	3.00E-04	4.3E-08	92.1%	2.7E-04	33.9%
Chromium	42.7	2.2E-07	6.3E-07	NA	5.00E-03	NA	NA	1.3E-04	15.8%
Vanadium	34	1.8E-07	5.0E-07	NA	7.00E-03	NA	NA	7.1E-05	9.0%
Total						4.7E-08	100.0%	7.9E-04	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	6.37E-10	1.78E-09	3.20E+01	2.50E-05	2.0E-08	2.1%	7.1E-05	0.7%
Aluminum	21500	0.001	3.11E-05	8.71E-05	NA	1.00E-01	NA	NA	8.7E-04	8.3%
Arsenic	5.5	0.032	2.55E-07	7.13E-07	3.66E+00	1.23E-04	9.3E-07	97.9%	5.8E-03	55.5%
Chromium	42.7	0.001	6.18E-08	1.73E-07	NA	1.00E-04	NA	NA	1.7E-03	16.6%
Vanadium	34	0.001	4.92E-08	1.38E-07	NA	7.00E-05	NA	NA	2.0E-03	18.9%
Total							9.5E-07	100.0%	1.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	3.7E-09	2.0E-08	2.4E-08	2.4%	1.3E-05	7.1E-05	8.4E-05	0.7%
Aluminum	NA	NA	NA	NA	3.2E-04	8.7E-04	1.2E-03	10.6%
Arsenic	4.3E-08	9.3E-07	9.8E-07	97.6%	2.7E-04	5.8E-03	6.1E-03	54.0%
Chromium	NA	NA	NA	NA	1.3E-04	1.7E-03	1.9E-03	16.5%
Vanadium	NA	NA	NA	NA	7.1E-05	2.0E-03	2.0E-03	18.2%
Total	4.7E-08	9.5E-07	1.0E-06	100.0%	7.9E-04	1.0E-02	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 2.1E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	2.7E-04	7.6E-04	NA	3.00E-01	NA	NA	2.5E-03	100.0%
					Total	NA	NA	2.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.4E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	3.11E-05	8.71E-05	NA	4.50E-02	NA	NA	1.9E-03	100.0%
Total							NA	NA	1.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.5E-03	1.9E-03	4.5E-03	100.0%
Total	NA	NA	NA	NA	2.5E-03	1.9E-03	4.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	3.5E-10	2.5E-08	1.60E+01	5.00E-05	5.7E-09	7.9%	5.0E-04	1.6%
Aluminum	21500	1.7E-04	1.2E-02	NA	1.00E+00	NA	NA	1.2E-02	39.7%
Arsenic	5.5	4.4E-08	3.1E-06	1.50E+00	3.00E-04	6.6E-08	92.1%	1.0E-02	33.9%
Chromium	42.7	3.4E-07	2.4E-05	NA	5.00E-03	NA	NA	4.8E-03	15.8%
Vanadium	34	2.7E-07	1.9E-05	NA	7.00E-03	NA	NA	2.7E-03	9.0%
Total						7.2E-08	100.0%	3.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	4.24E-11	2.97E-09	3.20E+01	2.50E-05	1.4E-09	2.1%	1.2E-04	0.7%
Aluminum	21500	0.001	2.07E-06	1.45E-04	NA	1.00E-01	NA	NA	1.5E-03	8.3%
Arsenic	5.5	0.032	1.70E-08	1.19E-06	3.66E+00	1.23E-04	6.2E-08	97.9%	9.7E-03	55.5%
Chromium	42.7	0.001	4.12E-09	2.88E-07	NA	1.00E-04	NA	NA	2.9E-03	16.6%
Vanadium	34	0.001	3.28E-09	2.30E-07	NA	7.00E-05	NA	NA	3.3E-03	18.9%
Total							6.3E-08	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	5.7E-09	1.4E-09	7.0E-09	5.2%	5.0E-04	1.2E-04	6.1E-04	1.3%
Aluminum	NA	NA	NA	NA	1.2E-02	1.5E-03	1.4E-02	28.3%
Arsenic	6.6E-08	6.2E-08	1.3E-07	94.8%	1.0E-02	9.7E-03	2.0E-02	41.7%
Chromium	NA	NA	NA	NA	4.8E-03	2.9E-03	7.7E-03	16.1%
Vanadium	NA	NA	NA	NA	2.7E-03	3.3E-03	6.0E-03	12.6%
Total	7.2E-08	6.3E-08	1.4E-07	100.0%	3.0E-02	1.7E-02	4.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 1, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 1, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	6.6	5.3E-08	3.7E-06	1.50E+00	3.00E-04	8.0E-08	100.0%	1.2E-02	100.0%
Total						8.0E-08	100.0%	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 1, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 1, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	6.6	0.032	2.04E-08	1.43E-06	3.66E+00	1.23E-04	7.5E-08	100.0%	1.2E-02	100.0%
Total							7.5E-08	100.0%	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 1, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Arsenic	8.0E-08	7.5E-08	1.5E-07	100.0%	1.2E-02	1.2E-02	2.4E-02	100.0%
Total	8.0E-08	7.5E-08	1.5E-07	100.0%	1.2E-02	1.2E-02	2.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day****Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	1.0E-04	7.3E-03	NA	3.00E-01	NA	NA	2.4E-02	100.0%
Total						NA	NA	2.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	1.24E-06	8.71E-05	NA	4.50E-02	NA	NA	1.9E-03	100.0%
						Total	NA	NA	1.9E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 3
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.4E-02	1.9E-03	2.6E-02	100.0%
Total	NA	NA	NA	NA	2.4E-02	1.9E-03	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	2.1E-08	6.0E-08	1.60E+01	5.00E-05	3.3E-07	7.9%	1.2E-03	1.6%
Aluminum	21500	1.0E-02	2.9E-02	NA	1.00E+00	NA	NA	2.9E-02	39.7%
Arsenic	5.5	2.6E-06	7.5E-06	1.50E+00	3.00E-04	3.9E-06	92.1%	2.5E-02	33.9%
Chromium	42.7	2.0E-05	5.8E-05	NA	5.00E-03	NA	NA	1.2E-02	15.8%
Vanadium	34	1.6E-05	4.7E-05	NA	7.00E-03	NA	NA	6.7E-03	9.0%
					Total	4.2E-06	100.0%	7.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 2, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.044	0.01	1.20E-08	3.50E-08	3.20E+01	2.50E-05	3.8E-07	2.1%	1.4E-03	0.7%
Aluminum	21500	0.001	5.86E-04	1.71E-03	NA	1.00E-01	NA	NA	1.7E-02	8.3%
Arsenic	5.5	0.032	4.79E-06	1.40E-05	3.66E+00	1.23E-04	1.8E-05	97.9%	1.1E-01	55.5%
Chromium	42.7	0.001	1.16E-06	3.39E-06	NA	1.00E-04	NA	NA	3.4E-02	16.6%
Vanadium	34	0.001	9.26E-07	2.70E-06	NA	7.00E-05	NA	NA	3.9E-02	18.9%
Total							1.8E-05	100.0%	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 2, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	3.3E-07	3.8E-07	7.1E-07	3.2%	1.2E-03	1.4E-03	2.6E-03	0.9%
Aluminum	NA	NA	NA	NA	2.9E-02	1.7E-02	4.7E-02	16.7%
Arsenic	3.9E-06	1.8E-05	2.1E-05	96.8%	2.5E-02	1.1E-01	1.4E-01	49.8%
Chromium	NA	NA	NA	NA	1.2E-02	3.4E-02	4.6E-02	16.4%
Vanadium	NA	NA	NA	NA	6.7E-03	3.9E-02	4.5E-02	16.2%
Total	4.2E-06	1.8E-05	2.2E-05	100.0%	7.4E-02	2.0E-01	2.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 3

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	6.1E-03	1.8E-02	NA	3.00E-01	NA	NA	5.9E-02	100.0%
					Total	NA	NA	5.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 3
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12900	0.001	3.51E-04	1.02E-03	NA	4.50E-02	NA	NA	2.3E-02	100.0%
						Total	NA	NA	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	5.9E-02	2.3E-02	8.2E-02	100.0%
Total	NA	NA	NA	NA	5.9E-02	2.3E-02	8.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 3****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	6.4E-10	6.4E-09	1.60E+01	5.00E-05	1.0E-08	6.0%	1.3E-04	1.1%
Aluminum	11161	5.1E-04	5.1E-03	NA	1.00E+00	NA	NA	5.1E-03	45.5%
Arsenic	2.34	1.1E-07	1.1E-06	1.50E+00	3.00E-04	1.6E-07	94.0%	3.6E-03	31.8%
Chromium	12.8	5.9E-07	5.9E-06	NA	5.00E-03	NA	NA	1.2E-03	10.4%
Vanadium	19	8.7E-07	8.7E-06	NA	7.00E-03	NA	NA	1.2E-03	11.1%
Total						1.7E-07	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.014	0.01	1.28E-10	1.28E-09	3.20E+01	2.50E-05	4.1E-09	1.6%	5.1E-05	0.5%
Aluminum	11161	0.001	1.02E-05	1.02E-04	NA	1.00E-01	NA	NA	1.0E-03	9.9%
Arsenic	2.34	0.032	6.86E-08	6.86E-07	3.66E+00	1.23E-04	2.5E-07	98.4%	5.6E-03	54.1%
Chromium	12.8	0.001	1.17E-08	1.17E-07	NA	1.00E-04	NA	NA	1.2E-03	11.4%
Vanadium	19	0.001	1.74E-08	1.74E-07	NA	7.00E-05	NA	NA	2.5E-03	24.1%
Total						2.6E-07	100.0%	1.0E-02	100.0%	

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 3
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.0E-08	4.1E-09	1.4E-08	3.4%	1.3E-04	5.1E-05	1.8E-04	0.8%
Aluminum	NA	NA	NA	NA	5.1E-03	1.0E-03	6.1E-03	28.5%
Arsenic	1.6E-07	2.5E-07	4.1E-07	96.6%	3.6E-03	5.6E-03	9.1E-03	42.5%
Chromium	NA	NA	NA	NA	1.2E-03	1.2E-03	2.3E-03	10.9%
Vanadium	NA	NA	NA	NA	1.2E-03	2.5E-03	3.7E-03	17.3%
Total	1.7E-07	2.6E-07	4.3E-07	100.0%	1.1E-02	1.0E-02	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	3.3E-09	2.3E-08	1.60E+01	5.00E-05	5.3E-08	19.3%	4.7E-04	4.6%
Aluminum	18920	7.4E-04	5.2E-03	NA	1.00E+00	NA	NA	5.2E-03	51.0%
Arsenic	3.8	1.5E-07	1.0E-06	1.50E+00	3.00E-04	2.2E-07	80.7%	3.5E-03	34.1%
Vanadium	26.9	1.1E-06	7.4E-06	NA	7.00E-03	NA	NA	1.1E-03	10.3%
Total						2.8E-07	100.0%	1.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 1,013 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	1.52E-09	1.06E-08	3.20E+01	2.50E-05	4.9E-08	5.8%	4.2E-04	2.1%
Aluminum	18920	0.001	3.38E-05	2.36E-04	NA	1.00E-01	NA	NA	2.4E-03	11.9%
Arsenic	3.8	0.032	2.17E-07	1.52E-06	3.66E+00	1.23E-04	7.9E-07	94.2%	1.2E-02	61.9%
Vanadium	26.9	0.001	4.80E-08	3.36E-07	NA	7.00E-05	NA	NA	4.8E-03	24.1%
Total							8.4E-07	100.0%	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	5.3E-08	4.9E-08	1.0E-07	9.1%	4.7E-04	4.2E-04	8.9E-04	3.0%
Aluminum	NA	NA	NA	NA	5.2E-03	2.4E-03	7.5E-03	25.1%
Arsenic	2.2E-07	7.9E-07	1.0E-06	90.9%	3.5E-03	1.2E-02	1.6E-02	52.5%
Vanadium	NA	NA	NA	NA	1.1E-03	4.8E-03	5.9E-03	19.4%
Total	2.8E-07	8.4E-07	1.1E-06	100.0%	1.0E-02	2.0E-02	3.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	3.8E-04	2.6E-03	NA	3.00E-01	NA	NA	8.8E-03	100.0%
					Total	NA	NA	8.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 1,013 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	1.73E-05	1.21E-04	NA	4.50E-02	NA	NA	2.7E-03	100.0%
Total						NA	NA	NA	2.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	8.8E-03	2.7E-03	1.2E-02	100.0%
Total	NA	NA	NA	NA	8.8E-03	2.7E-03	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURE

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	3.3E-10	1.2E-08	1.60E+01	5.00E-05	5.3E-09	19.3%	2.3E-04	4.6%
Aluminum	18920	7.4E-05	2.6E-03	NA	1.00E+00	NA	NA	2.6E-03	51.0%
Arsenic	3.8	1.5E-08	5.2E-07	1.50E+00	3.00E-04	2.2E-08	80.7%	1.7E-03	34.1%
Vanadium	26.9	1.1E-07	3.7E-06	NA	7.00E-03	NA	NA	5.3E-04	10.3%
Total						2.8E-08	100.0%	5.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.6E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURE
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	3.03E-10	1.06E-08	3.20E+01	2.50E-05	9.7E-09	5.8%	4.2E-04	2.1%
Aluminum	18920	0.001	6.75E-06	2.36E-04	NA	1.00E-01	NA	NA	2.4E-03	11.9%
Arsenic	3.8	0.032	4.34E-08	1.52E-06	3.66E+00	1.23E-04	1.6E-07	94.2%	1.2E-02	61.9%
Vanadium	26.9	0.001	9.60E-09	3.36E-07	NA	7.00E-05	NA	NA	4.8E-03	24.1%
Total							1.7E-07	100.0%	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	5.3E-09	9.7E-09	1.5E-08	7.7%	2.3E-04	4.2E-04	6.6E-04	2.6%
Aluminum	NA	NA	NA	NA	2.6E-03	2.4E-03	5.0E-03	19.8%
Arsenic	2.2E-08	1.6E-07	1.8E-07	92.3%	1.7E-03	1.2E-02	1.4E-02	56.3%
Vanadium	NA	NA	NA	NA	5.3E-04	4.8E-03	5.3E-03	21.3%
Total	2.8E-08	1.7E-07	2.0E-07	100.0%	5.1E-03	2.0E-02	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 5.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	4.3E-09	1.5E-08	1.60E+01	5.00E-05	6.8E-08	19.3%	3.0E-04	4.6%
Aluminum	18920	9.5E-04	3.3E-03	NA	1.00E+00	NA	NA	3.3E-03	51.0%
Arsenic	3.8	1.9E-07	6.7E-07	1.50E+00	3.00E-04	2.9E-07	80.7%	2.2E-03	34.1%
Vanadium	26.9	1.4E-06	4.7E-06	NA	7.00E-03	NA	NA	6.8E-04	10.3%
Total						3.6E-07	100.0%	6.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	2.46E-09	8.61E-09	3.20E+01	2.50E-05	7.9E-08	5.8%	3.4E-04	2.1%
Aluminum	18920	0.001	5.47E-05	1.92E-04	NA	1.00E-01	NA	NA	1.9E-03	11.9%
Arsenic	3.8	0.032	3.52E-07	1.23E-06	3.66E+00	1.23E-04	1.3E-06	94.2%	1.0E-02	61.9%
Vanadium	26.9	0.001	7.78E-08	2.72E-07	NA	7.00E-05	NA	NA	3.9E-03	24.1%
Total							1.4E-06	100.0%	1.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	6.8E-08	7.9E-08	1.5E-07	8.5%	3.0E-04	3.4E-04	6.4E-04	2.8%
Aluminum	NA	NA	NA	NA	3.3E-03	1.9E-03	5.2E-03	23.1%
Arsenic	2.9E-07	1.3E-06	1.6E-06	91.5%	2.2E-03	1.0E-02	1.2E-02	53.9%
Vanadium	NA	NA	NA	NA	6.8E-04	3.9E-03	4.6E-03	20.1%
Total	3.6E-07	1.4E-06	1.7E-06	100.0%	6.5E-03	1.6E-02	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	4.9E-04	1.7E-03	NA	3.00E-01	NA	NA	5.7E-03	100.0%
					Total	NA	NA	5.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	2.80E-05	9.79E-05	NA	4.50E-02	NA	NA	2.2E-03	100.0%
Total							NA	NA	2.2E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	5.7E-03	2.2E-03	7.9E-03	100.0%
Total	NA	NA	NA	NA	5.7E-03	2.2E-03	7.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	50 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	45 Exposure Frequency (days/year)
ED =	7 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.8E-09 kg-soil/kg-wt/day

Chronic Daily Intake = 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	7.5E-10	7.5E-09	1.60E+01	5.00E-05	1.2E-08	19.3%	1.5E-04	4.6%
Aluminum	18920	1.7E-04	1.7E-03	NA	1.00E+00	NA	NA	1.7E-03	51.0%
Arsenic	3.8	3.3E-08	3.3E-07	1.50E+00	3.00E-04	5.0E-08	80.7%	1.1E-03	34.1%
Vanadium	26.9	2.4E-07	2.4E-06	NA	7.00E-03	NA	NA	3.4E-04	10.3%
Total						6.2E-08	100.0%	3.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,000 Skin surface available for contact (cm ² /event)
AF =	0.2 Soil to skin adherence factor (mg/cm ²)
ABS =	Chemical Specific Absorption factor (unitless)
EF =	45 Exposure frequency (events/year)
ED =	7 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	1.50E-10	1.50E-09	3.20E+01	2.50E-05	4.8E-09	5.8%	6.0E-05	2.1%
Aluminum	18920	0.001	3.33E-06	3.33E-05	NA	1.00E-01	NA	NA	3.3E-04	11.9%
Arsenic	3.8	0.032	2.14E-08	2.14E-07	3.66E+00	1.23E-04	7.8E-08	94.2%	1.7E-03	61.9%
Vanadium	26.9	0.001	4.74E-09	4.74E-08	NA	7.00E-05	NA	NA	6.8E-04	24.1%
Total							8.3E-08	100.0%	2.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.2E-08	4.8E-09	1.7E-08	11.5%	1.5E-04	6.0E-05	2.1E-04	3.4%
Aluminum	NA	NA	NA	NA	1.7E-03	3.3E-04	2.0E-03	32.9%
Arsenic	5.0E-08	7.8E-08	1.3E-07	88.5%	1.1E-03	1.7E-03	2.9E-03	47.0%
Vanadium	NA	NA	NA	NA	3.4E-04	6.8E-04	1.0E-03	16.7%
Total	6.2E-08	8.3E-08	1.5E-07	100.0%	3.3E-03	2.8E-03	6.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	1.5E-08	4.2E-08	1.60E+01	5.00E-05	2.4E-07	19.3%	8.3E-04	4.6%
Aluminum	18920	3.3E-03	9.3E-03	NA	1.00E+00	NA	NA	9.3E-03	51.0%
Arsenic	3.8	6.6E-07	1.9E-06	1.50E+00	3.00E-04	1.0E-06	80.7%	6.2E-03	34.1%
Vanadium	26.9	4.7E-06	1.3E-05	NA	7.00E-03	NA	NA	1.9E-03	10.3%
					Total	1.2E-06	100.0%	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	6.83E-09	1.91E-08	3.20E+01	2.50E-05	2.2E-07	5.8%	7.7E-04	2.1%
Aluminum	18920	0.001	1.52E-04	4.26E-04	NA	1.00E-01	NA	NA	4.3E-03	11.9%
Arsenic	3.8	0.032	9.77E-07	2.74E-06	3.66E+00	1.23E-04	3.6E-06	94.2%	2.2E-02	61.9%
Vanadium	26.9	0.001	2.16E-07	6.05E-07	NA	7.00E-05	NA	NA	8.6E-03	24.1%
Total							3.8E-06	100.0%	3.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	2.4E-07	2.2E-07	4.6E-07	9.1%	8.3E-04	7.7E-04	1.6E-03	3.0%
Aluminum	NA	NA	NA	NA	9.3E-03	4.3E-03	1.4E-02	25.0%
Arsenic	1.0E-06	3.6E-06	4.6E-06	90.9%	6.2E-03	2.2E-02	2.8E-02	52.6%
Vanadium	NA	NA	NA	NA	1.9E-03	8.6E-03	1.1E-02	19.5%
Total	1.2E-06	3.8E-06	5.0E-06	100.0%	1.8E-02	3.6E-02	5.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.7E-07 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 20, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	1.7E-03	4.7E-03	NA	3.00E-01	NA	NA	1.6E-02	100.0%
					Total	NA	NA	1.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	7.77E-05	2.18E-04	NA	4.50E-02	NA	NA	4.8E-03	100.0%
Total							NA	NA	4.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.6E-02	4.8E-03	2.1E-02	100.0%
Total	NA	NA	NA	NA	1.6E-02	4.8E-03	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 6.3E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	5.3E-09	4.2E-08	1.60E+01	5.00E-05	8.6E-08	19.3%	8.3E-04	4.6%
Aluminum	18920	1.2E-03	9.3E-03	NA	1.00E+00	NA	NA	9.3E-03	51.0%
Arsenic	3.8	2.4E-07	1.9E-06	1.50E+00	3.00E-04	3.6E-07	80.7%	6.2E-03	34.1%
Vanadium	26.9	1.7E-06	1.3E-05	NA	7.00E-03	NA	NA	1.9E-03	10.3%
					Total	4.4E-07	100.0%	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	4.92E-10	3.83E-09	3.20E+01	2.50E-05	1.6E-08	5.8%	1.5E-04	2.1%
Aluminum	18920	0.001	1.09E-05	8.52E-05	NA	1.00E-01	NA	NA	8.5E-04	11.9%
Arsenic	3.8	0.032	7.04E-08	5.47E-07	3.66E+00	1.23E-04	2.6E-07	94.2%	4.4E-03	61.9%
Vanadium	26.9	0.001	1.56E-08	1.21E-07	NA	7.00E-05	NA	NA	1.7E-03	24.1%
Total							2.7E-07	100.0%	7.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	8.6E-08	1.6E-08	1.0E-07	14.1%	8.3E-04	1.5E-04	9.8E-04	3.9%
Aluminum	NA	NA	NA	NA	9.3E-03	8.5E-04	1.0E-02	39.9%
Arsenic	3.6E-07	2.6E-07	6.2E-07	85.9%	6.2E-03	4.4E-03	1.1E-02	42.0%
Vanadium	NA	NA	NA	NA	1.9E-03	1.7E-03	3.6E-03	14.2%
Total	4.4E-07	2.7E-07	7.2E-07	100.0%	1.8E-02	7.2E-03	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 4, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 4, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	8.9E-10	2.5E-09	1.60E+01	5.00E-05	1.4E-08	19.3%	5.0E-05	4.6%
Aluminum	18920	2.0E-04	5.6E-04	NA	1.00E+00	NA	NA	5.6E-04	51.0%
Arsenic	3.8	4.0E-08	1.1E-07	1.50E+00	3.00E-04	6.0E-08	80.7%	3.7E-04	34.1%
Vanadium	26.9	2.8E-07	7.9E-07	NA	7.00E-03	NA	NA	1.1E-04	10.3%
Total						7.4E-08	100.0%	1.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 4, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	0.6 Soil to skin adherence factor (mg/cm ²)
ABS =	Chemical Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day****Chronic Daily Intake = 4.1E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 4, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	1.23E-09	3.44E-09	3.20E+01	2.50E-05	3.9E-08	5.8%	1.4E-04	2.1%
Aluminum	18920	0.001	2.74E-05	7.66E-05	NA	1.00E-01	NA	NA	7.7E-04	11.9%
Arsenic	3.8	0.032	1.76E-07	4.93E-07	3.66E+00	1.23E-04	6.4E-07	94.2%	4.0E-03	61.9%
Vanadium	26.9	0.001	3.89E-08	1.09E-07	NA	7.00E-05	NA	NA	1.6E-03	24.1%
Total							6.8E-07	100.0%	6.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 4, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.4E-08	3.9E-08	5.4E-08	7.1%	5.0E-05	1.4E-04	1.9E-04	2.5%
Aluminum	NA	NA	NA	NA	5.6E-04	7.7E-04	1.3E-03	17.5%
Arsenic	6.0E-08	6.4E-07	7.0E-07	92.9%	3.7E-04	4.0E-03	4.4E-03	57.9%
Vanadium	NA	NA	NA	NA	1.1E-04	1.6E-03	1.7E-03	22.1%
Total	7.4E-08	6.8E-07	7.6E-07	100.0%	1.1E-03	6.6E-03	7.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 2.1E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	2.0E-04	5.7E-04	NA	3.00E-01	NA	NA	1.9E-03	100.0%
					Total	NA	NA	1.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.4E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	2.33E-05	6.53E-05	NA	4.50E-02	NA	NA	1.5E-03	100.0%
Total							NA	NA	1.5E-03	100.0%

R4708989

D3-161

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.9E-03	1.5E-03	3.3E-03	100.0%
Total	NA	NA	NA	NA	1.9E-03	1.5E-03	3.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	6.8E-10	4.8E-08	1.60E+01	5.00E-05	1.1E-08	19.3%	9.6E-04	4.6%
Aluminum	18920	1.5E-04	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	51.0%
Arsenic	3.8	3.1E-08	2.1E-06	1.50E+00	3.00E-04	4.6E-08	80.7%	7.1E-03	34.1%
Vanadium	26.9	2.2E-07	1.5E-05	NA	7.00E-03	NA	NA	2.2E-03	10.3%
					Total	5.7E-08	100.0%	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

R4708999

D3-165

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	8.20E-11	5.74E-09	3.20E+01	2.50E-05	2.6E-09	5.8%	2.3E-04	2.1%
Aluminum	18920	0.001	1.82E-06	1.28E-04	NA	1.00E-01	NA	NA	1.3E-03	11.9%
Arsenic	3.8	0.032	1.17E-08	8.21E-07	3.66E+00	1.23E-04	4.3E-08	94.2%	6.7E-03	61.9%
Vanadium	26.9	0.001	2.59E-09	1.82E-07	NA	7.00E-05	NA	NA	2.6E-03	24.1%
Total							4.6E-08	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.1E-08	2.6E-09	1.4E-08	13.3%	9.6E-04	2.3E-04	1.2E-03	3.7%
Aluminum	NA	NA	NA	NA	1.1E-02	1.3E-03	1.2E-02	37.7%
Arsenic	4.6E-08	4.3E-08	8.9E-08	86.7%	7.1E-03	6.7E-03	1.4E-02	43.6%
Vanadium	NA	NA	NA	NA	2.2E-03	2.6E-03	4.8E-03	15.0%
Total	5.7E-08	4.6E-08	1.0E-07	100.0%	2.1E-02	1.1E-02	3.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 8.1E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	7.8E-05	5.5E-03	NA	3.00E-01	NA	NA	1.8E-02	100.0%
					Total	NA	NA	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	9.33E-07	6.53E-05	NA	4.50E-02	NA	NA	1.5E-03	100.0%
						Total	NA	NA	1.5E-03	100.0%

R4708969

D3-171

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.8E-02	1.5E-03	2.0E-02	100.0%
Total	NA	NA	NA	NA	1.8E-02	1.5E-03	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	6.4	5.2E-08	3.6E-06	1.50E+00	3.00E-04	7.7E-08	100.0%	1.2E-02	100.0%
					Total	7.7E-08	100.0%	1.2E-02	100.0%

D3-173

CTO-0028

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SUBSURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	6.4	0.032	1.98E-08	1.38E-06	3.66E+00	1.23E-04	7.2E-08	100.0%	1.1E-02	100.0%
Total							7.2E-08	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 4****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Arsenic	7.7E-08	7.2E-08	1.5E-07	100.0%	1.2E-02	1.1E-02	2.3E-02	100.0%
Total	7.7E-08	7.2E-08	1.5E-07	100.0%	1.2E-02	1.1E-02	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL - 2 TO 22 FEET
DATE: AUGUST 27, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL - 2 TO 22 FEET
DATE: AUGUST 27, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	1.5E-08	1.1E-06	7.30E-01	NA	1.1E-08	6.4%	NA	NA
Benzo(a)pyrene	1.1	8.9E-09	6.2E-07	7.30E+00	NA	6.5E-08	37.0%	NA	NA
Benzo(b)fluoranthene	1.2	9.7E-09	6.8E-07	7.30E-01	NA	7.1E-09	4.0%	NA	NA
Benzo(k)fluoranthene	0.59	4.8E-09	3.3E-07	7.30E-02	NA	3.5E-10	0.2%	NA	NA
Chrysene	0.94	7.6E-09	5.3E-07	7.30E-03	NA	5.5E-11	0.0%	NA	NA
Dibenzo(a,h)anthracene	0.23	1.9E-09	1.3E-07	7.30E+00	NA	1.4E-08	7.7%	NA	NA
Indeno(1,2,3-cd)pyrene	0.12	9.7E-10	6.8E-08	7.30E-01	NA	7.1E-10	0.4%	NA	NA
Arsenic	6.4	5.2E-08	3.6E-06	1.50E+00	3.00E-04	7.7E-08	44.2%	1.2E-02	100.0%
					Total	1.7E-07	100.0%	1.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL - 2 TO 22 FEET
DATE: AUGUST 27, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SUBSURFACE SOIL - 2 TO 22 FEET
 DATE: AUGUST 27, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	1.83E-09	1.28E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.1	0.01	1.06E-09	7.43E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2	0.01	1.16E-09	8.10E-08	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.59	0.01	5.69E-10	3.98E-08	NA	NA	NA	NA	NA	NA
Chrysene	0.94	0.01	9.07E-10	6.35E-08	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.23	0.01	2.22E-10	1.55E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.12	0.01	1.16E-10	8.10E-09	NA	NA	NA	NA	NA	NA
Arsenic	6.4	0.032	1.98E-08	1.38E-06	3.66E+00	1.23E-04	7.2E-08	100.0%	1.1E-02	100.0%
Total							7.2E-08	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL - 2 TO 22 FEET
DATE: AUGUST 27, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.1E-08	NA	1.1E-08	4.5%	NA	NA	NA	NA
Benzo(a)pyrene	6.5E-08	NA	6.5E-08	26.2%	NA	NA	NA	NA
Benzo(b)fluoranthene	7.1E-09	NA	7.1E-09	2.9%	NA	NA	NA	NA
Benzo(k)fluoranthene	3.5E-10	NA	3.5E-10	0.1%	NA	NA	NA	NA
Chrysene	5.5E-11	NA	5.5E-11	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.4E-08	NA	1.4E-08	5.5%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	7.1E-10	NA	7.1E-10	0.3%	NA	NA	NA	NA
Arsenic	7.7E-08	7.2E-08	1.5E-07	60.5%	1.2E-02	1.1E-02	2.3E-02	100.0%
Total	1.7E-07	7.2E-08	2.5E-07	100.0%	1.2E-02	1.1E-02	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	4.0E-08	1.2E-07	1.60E+01	5.00E-05	6.4E-07	19.3%	2.3E-03	4.6%
Aluminum	18920	8.9E-03	2.6E-02	NA	1.00E+00	NA	NA	2.6E-02	51.0%
Arsenic	3.8	1.8E-06	5.2E-06	1.50E+00	3.00E-04	2.7E-06	80.7%	1.7E-02	34.1%
Vanadium	26.9	1.3E-05	3.7E-05	NA	7.00E-03	NA	NA	5.3E-03	10.3%
					Total	3.3E-08	100.0%	6.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	2.32E-08	6.75E-08	3.20E+01	2.50E-05	7.4E-07	5.8%	2.7E-03	2.1%
Aluminum	18920	0.001	5.15E-04	1.50E-03	NA	1.00E-01	NA	NA	1.5E-02	11.9%
Arsenic	3.8	0.032	3.31E-06	9.66E-06	3.66E+00	1.23E-04	1.2E-05	94.2%	7.9E-02	61.9%
Vanadium	26.9	0.001	7.33E-07	2.14E-06	NA	7.00E-05	NA	NA	3.1E-02	24.1%
Total							1.3E-05	100.0%	1.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	6.4E-07	7.4E-07	1.4E-06	8.5%	2.3E-03	2.7E-03	5.0E-03	2.8%
Aluminum	NA	NA	NA	NA	2.6E-02	1.5E-02	4.1E-02	23.0%
Arsenic	2.7E-06	1.2E-05	1.5E-05	91.5%	1.7E-02	7.9E-02	9.6E-02	54.0%
Vanadium	NA	NA	NA	NA	5.3E-03	3.1E-02	3.6E-02	20.1%
Total	3.3E-06	1.3E-05	1.6E-05	100.0%	6.1E-02	1.3E-01	1.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	4.5E-03	1.3E-02	NA	3.00E-01	NA	NA	4.4E-02	100.0%
					Total	NA	NA	4.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	2.63E-04	7.68E-04	NA	4.50E-02	NA	NA	1.7E-02	100.0%
						Total	NA	NA	1.7E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	4.4E-02	1.7E-02	6.1E-02	100.0%
Total	NA	NA	NA	NA	4.4E-02	1.7E-02	6.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	3.9E-09	3.9E-08	1.60E+01	5.00E-05	6.2E-08	19.3%	7.8E-04	4.6%
Aluminum	18920	8.7E-04	8.7E-03	NA	1.00E+00	NA	NA	8.7E-03	51.0%
Arsenic	3.8	1.7E-07	1.7E-06	1.50E+00	3.00E-04	2.6E-07	80.7%	5.8E-03	34.1%
Vanadium	26.9	1.2E-06	1.2E-05	NA	7.00E-03	NA	NA	1.8E-03	10.3%
Total						3.2E-07	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	7.78E-10	7.78E-09	3.20E+01	2.50E-05	2.5E-08	5.8%	3.1E-04	2.1%
Aluminum	18920	0.001	1.73E-05	1.73E-04	NA	1.00E-01	NA	NA	1.7E-03	11.9%
Arsenic	3.8	0.032	1.11E-07	1.11E-06	3.66E+00	1.23E-04	4.1E-07	94.2%	9.1E-03	61.9%
Vanadium	26.9	0.001	2.46E-08	2.46E-07	NA	7.00E-05	NA	NA	3.5E-03	24.1%
Total							4.3E-07	100.0%	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	6.2E-08	2.5E-08	8.7E-08	11.5%	7.8E-04	3.1E-04	1.1E-03	3.4%
Aluminum	NA	NA	NA	NA	8.7E-03	1.7E-03	1.0E-02	32.9%
Arsenic	2.6E-07	4.1E-07	6.7E-07	88.5%	5.8E-03	9.1E-03	1.5E-02	47.0%
Vanadium	NA	NA	NA	NA	1.8E-03	3.5E-03	5.3E-03	16.7%
Total	3.2E-07	4.3E-07	7.6E-07	100.0%	1.7E-02	1.5E-02	3.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	9.3E-08	1.1E-06	1.60E+01	5.00E-05	1.5E-06	19.3%	2.2E-02	4.6%
Aluminum	18920	2.1E-02	2.4E-01	NA	1.00E+00	NA	NA	2.4E-01	51.0%
Arsenic	3.8	4.2E-06	4.9E-05	1.50E+00	3.00E-04	6.2E-06	80.7%	1.6E-01	34.1%
Vanadium	26.9	2.9E-05	3.4E-04	NA	7.00E-03	NA	NA	4.9E-02	10.3%
Total						7.7E-06	100.0%	4.7E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SAsoil/adj = 766 Skin surface available for contact (cm²-year/kg)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	8.92E-09	1.04E-07	3.20E+01	2.50E-05	2.9E-07	5.8%	4.2E-03	2.1%
Aluminum	18920	0.001	1.99E-04	2.32E-03	NA	1.00E-01	NA	NA	2.3E-02	11.9%
Arsenic	3.8	0.032	1.28E-06	1.49E-05	3.66E+00	1.23E-04	4.7E-06	94.2%	1.2E-01	61.9%
Vanadium	26.9	0.001	2.82E-07	3.29E-06	NA	7.00E-05	NA	NA	4.7E-02	24.1%
Total							5.0E-06	100.0%	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.5E-06	2.9E-07	1.8E-06	14.0%	2.2E-02	4.2E-03	2.6E-02	3.9%
Aluminum	NA	NA	NA	NA	2.4E-01	2.3E-02	2.7E-01	39.6%
Arsenic	6.2E-06	4.7E-06	1.1E-05	86.0%	1.6E-01	1.2E-01	2.8E-01	42.2%
Vanadium	NA	NA	NA	NA	4.9E-02	4.7E-02	9.6E-02	14.4%
Total	7.7E-06	5.0E-06	1.3E-05	100.0%	4.7E-01	2.0E-01	6.7E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs =:	Mean concentration in soil (mg/kg)
IR =:	200 Soil Ingestion Rate (mg/day)
CF =:	1.0E-06 Conversion Factor (kg/mg)
FI =:	1 Fraction from contaminated source (unitless)
EF =:	350 Exposure Frequency (days/year)
ED =:	6 Exposure Duration (years)
BW =:	15 Body Weight (kg)
ATc =:	25,550 Averaging time for carcinogenic exposures (days)
ATn =:	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake =: 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 4

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	1.1E-02	1.2E-01	NA	3.00E-01	NA	NA	4.1E-01	100.0%
					Total	NA	NA	4.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA **SITE 4**
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj = :	766 Skin surface available for contact (cm ² ·year/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	1.01E-04	1.18E-03	NA	4.50E-02	NA	NA	2.6E-02	100.0%
Total							NA	NA	2.6E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	4.1E-01	2.6E-02	4.4E-01	100.0%
Total	NA	NA	NA	NA	4.1E-01	2.6E-02	4.4E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	100 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	234 Exposure Frequency (days/year)
ED =	2 Exposure Duration (years)
BW =	15 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake =: 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	1.0E-08	3.6E-07	1.60E+01	5.00E-05	1.7E-07	19.3%	7.3E-03	4.6%
Aluminum	18920	2.3E-03	8.1E-02	NA	1.00E+00	NA	NA	8.1E-02	51.0%
Arsenic	3.8	4.6E-07	1.6E-05	1.50E+00	3.00E-04	7.0E-07	80.7%	5.4E-02	34.1%
Vanadium	26.9	3.3E-06	1.1E-04	NA	7.00E-03	NA	NA	1.6E-02	10.3%
Total						8.6E-07	100.0%	1.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SAsoil/adj	663 Skin surface available for contact (cm ² -year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Dieldrin	0.085	0.01	1.03E-09	3.61E-08	3.20E+01	2.50E-05	3.3E-08	5.8%	1.4E-03	2.1%
Aluminum	18920	0.001	2.30E-05	8.04E-04	NA	1.00E-01	NA	NA	8.0E-03	11.9%
Arsenic	3.8	0.032	1.48E-07	5.17E-06	3.66E+00	1.23E-04	5.4E-07	94.2%	4.2E-02	61.9%
Vanadium	26.9	0.001	3.27E-08	1.14E-06	NA	7.00E-05	NA	NA	1.6E-02	24.1%
Total							5.7E-07	100.0%	6.8E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Dieldrin	1.7E-07	3.3E-08	2.0E-07	13.9%	7.3E-03	1.4E-03	8.7E-03	3.8%
Aluminum	NA	NA	NA	NA	8.1E-02	8.0E-03	8.9E-02	39.2%
Arsenic	7.0E-07	5.4E-07	1.2E-06	86.1%	5.4E-02	4.2E-02	9.6E-02	42.4%
Vanadium	NA	NA	NA	NA	1.6E-02	1.6E-02	3.3E-02	14.5%
Total	8.6E-07	5.7E-07	1.4E-06	100.0%	1.6E-01	6.8E-02	2.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day**

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	1.2E-03	4.1E-02	NA	3.00E-01	NA	NA	1.4E-01	100.0%
					Total	NA	NA	1.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 4
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA adj = : 663 Skin surface available for contact (cm² year/kg)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

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CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 4****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	9671	0.001	1.17E-05	4.11E-04	NA	4.50E-02	NA	NA	9.1E-03	100.0%
Total							NA	NA	9.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 4
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.4E-01	9.1E-03	1.5E-01	100.0%
Total	NA	NA	NA	NA	1.4E-01	9.1E-03	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 3.9E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	7.4E-08	5.2E-07	7.30E-01	NA	5.4E-08	5.3%	NA	NA
Benzo(a)pyrene	1.9	7.4E-08	5.2E-07	7.30E+00	NA	5.4E-07	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	8.2E-08	5.8E-07	7.30E-01	NA	6.0E-08	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	6.7E-08	4.7E-07	7.30E-02	NA	4.9E-09	0.5%	NA	NA
Chrysene	2.1	8.2E-08	5.8E-07	7.30E-03	NA	6.0E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	7.8E-09	5.5E-08	7.30E+00	NA	5.7E-08	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	6.3E-08	4.4E-07	7.30E-01	NA	4.6E-08	4.5%	NA	NA
Aroclor-1260	0.6	2.3E-08	1.6E-07	2.00E+00	NA	4.7E-08	4.6%	NA	NA
Aluminum	29100	1.1E-03	8.0E-03	NA	1.00E+00	NA	NA	8.0E-03	48.7%
Arsenic	3.5	1.4E-07	9.6E-07	1.50E+00	3.00E-04	2.1E-07	20.2%	3.2E-03	19.5%
Chromium	65	2.5E-06	1.8E-05	NA	5.00E-03	NA	NA	3.6E-03	21.7%
Vanadium	42.2	1.7E-06	1.2E-05	NA	7.00E-03	NA	NA	1.7E-03	10.1%
					Total	1.0E-06	100.0%	1.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	3.39E-08	2.37E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	3.39E-08	2.37E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	3.75E-08	2.62E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	3.03E-08	2.12E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	3.75E-08	2.62E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	3.57E-09	2.50E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	2.85E-08	2.00E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	1.07E-08	7.49E-08	2.22E+00	NA	2.4E-08	3.1%	NA	NA
Aluminum	29100	0.001	5.19E-05	3.63E-04	NA	1.00E-01	NA	NA	3.6E-03	11.9%
Arsenic	3.5	0.032	2.00E-07	1.40E-06	3.66E+00	1.23E-04	7.3E-07	96.9%	1.1E-02	37.1%
Chromium	65	0.001	1.16E-07	8.12E-07	NA	1.00E-04	NA	NA	8.1E-03	26.5%
Vanadium	42.2	0.001	7.53E-08	5.27E-07	NA	7.00E-05	NA	NA	7.5E-03	24.6%
Total							7.6E-07	100.0%	3.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	5.4E-08	NA	5.4E-08	3.1%	NA	NA	NA	NA
Benzo(a)pyrene	5.4E-07	NA	5.4E-07	30.6%	NA	NA	NA	NA
Benzo(b)fluoranthene	6.0E-08	NA	6.0E-08	3.4%	NA	NA	NA	NA
Benzo(k)fluoranthene	4.9E-09	NA	4.9E-09	0.3%	NA	NA	NA	NA
Chrysene	6.0E-10	NA	6.0E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	5.7E-08	NA	5.7E-08	3.2%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	4.6E-08	NA	4.6E-08	2.6%	NA	NA	NA	NA
Aroclor-1260	4.7E-08	2.4E-08	7.1E-08	4.0%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	8.0E-03	3.6E-03	1.2E-02	24.7%
Arsenic	2.1E-07	7.3E-07	9.4E-07	52.8%	3.2E-03	1.1E-02	1.5E-02	31.0%
Chromium	NA	NA	NA	NA	3.6E-03	8.1E-03	1.2E-02	24.8%
Vanadium	NA	NA	NA	NA	1.7E-03	7.5E-03	9.2E-03	19.5%
Total	1.0E-06	7.6E-07	1.8E-06	100.0%	1.6E-02	3.1E-02	4.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	100 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	45 Exposure Frequency (days/year)
ED =	10 Exposure Duration (years)
BW =	45 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = 2.7E-07 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	1.4E-04	9.8E-04	NA	3.00E-02	NA	NA	3.3E-02	100.0%
					Total	NA	NA	3.3E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA **SITE 6**
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	6.39E-05	4.47E-04	NA	2.00E-02	NA	NA	2.2E-02	100.0%
Total						NA	NA	NA	2.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	3.3E-02	2.2E-02	5.5E-02	100.0%
Total	NA	NA	NA	NA	3.3E-02	2.2E-02	5.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	5.8E-04	4.1E-03	NA	3.00E-01	NA	NA	1.4E-02	100.0%
					Total	NA	NA	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	1,013 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	45 Exposure frequency (events/year)
ED =	Exposure duration (years)
BW =	Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	2.64E-05	1.85E-04	NA	4.50E-02	NA	NA	4.1E-03	100.0%
Total							NA	NA	4.1E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.4E-02	4.1E-03	1.8E-02	100.0%
Total	NA	NA	NA	NA	1.4E-02	4.1E-03	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 3.9E-09 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.4E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	6.5E-09	2.3E-07	7.30E-01	NA	4.7E-09	5.2%	NA	NA
Benzo(a)pyrene	1.75	6.8E-09	2.4E-07	7.30E+00	NA	5.0E-08	55.4%	NA	NA
Benzo(b)fluoranthene	2.05	8.0E-09	2.8E-07	7.30E-01	NA	5.9E-09	6.5%	NA	NA
Benzo(k)fluoranthene	1.6	6.3E-09	2.2E-07	7.30E-02	NA	4.6E-10	0.5%	NA	NA
Chrysene	1.9	7.4E-09	2.6E-07	7.30E-03	NA	5.4E-11	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.13	5.1E-10	1.8E-08	7.30E+00	NA	3.7E-09	4.1%	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	5.9E-09	2.1E-07	7.30E-01	NA	4.3E-09	4.8%	NA	NA
Aroclor-1260	0.6	2.3E-09	8.2E-08	2.00E+00	NA	4.7E-09	5.2%	NA	NA
Aluminum	17390	6.8E-05	2.4E-03	NA	1.00E+00	NA	NA	2.4E-03	43.5%
Arsenic	2.8	1.1E-08	3.8E-07	1.50E+00	3.00E-04	1.6E-08	18.2%	1.3E-03	23.3%
Chromium	40.7	1.6E-07	5.6E-06	NA	5.00E-03	NA	NA	1.1E-03	20.3%
Vanadium	36	1.4E-07	4.9E-06	NA	7.00E-03	NA	NA	7.0E-04	12.9%
Total						9.0E-08	100.0%	5.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.6E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	0.01	5.89E-09	2.06E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.75	0.01	6.24E-09	2.19E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.05	0.01	7.32E-09	2.56E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.6	0.01	5.71E-09	2.00E-07	NA	NA	NA	NA	NA	NA
Chrysene	1.9	0.01	6.78E-09	2.37E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.13	0.01	4.64E-10	1.62E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	0.01	5.35E-09	1.87E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	2.14E-09	7.49E-08	2.22E+00	NA	4.8E-09	3.9%	NA	NA
Aluminum	17390	0.001	6.21E-06	2.17E-04	NA	1.00E-01	NA	NA	2.2E-03	9.5%
Arsenic	2.8	0.032	3.20E-08	1.12E-06	3.66E+00	1.23E-04	1.2E-07	96.1%	9.1E-03	39.9%
Chromium	40.7	0.001	1.45E-08	5.08E-07	NA	1.00E-04	NA	NA	5.1E-03	22.3%
Vanadium	36	0.001	1.28E-08	4.50E-07	NA	7.00E-05	NA	NA	6.4E-03	28.2%
Total							1.2E-07	100.0%	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	4.7E-09	NA	4.7E-09	2.2%	NA	NA	NA	NA
Benzo(a)pyrene	5.0E-08	NA	5.0E-08	23.6%	NA	NA	NA	NA
Benzo(b)fluoranthene	5.9E-09	NA	5.9E-09	2.8%	NA	NA	NA	NA
Benzo(k)fluoranthene	4.6E-10	NA	4.6E-10	0.2%	NA	NA	NA	NA
Chrysene	5.4E-11	NA	5.4E-11	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	3.7E-09	NA	3.7E-09	1.8%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	4.3E-09	NA	4.3E-09	2.0%	NA	NA	NA	NA
Aroclor-1260	4.7E-09	4.8E-09	9.4E-09	4.5%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	2.4E-03	2.2E-03	4.6E-03	16.1%
Arsenic	1.6E-08	1.2E-07	1.3E-07	63.0%	1.3E-03	9.1E-03	1.0E-02	36.7%
Chromium	NA	NA	NA	NA	1.1E-03	5.1E-03	6.2E-03	21.9%
Vanadium	NA	NA	NA	NA	7.0E-04	6.4E-03	7.1E-03	25.2%
Total	9.0E-08	1.2E-07	2.1E-07	100.0%	5.5E-03	2.3E-02	2.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	9.6E-08	3.3E-07	7.30E-01	NA	7.0E-08	5.3%	NA	NA
Benzo(a)pyrene	1.9	9.6E-08	3.3E-07	7.30E+00	NA	7.0E-07	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	1.1E-07	3.7E-07	7.30E-01	NA	7.7E-08	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	8.6E-08	3.0E-07	7.30E-02	NA	6.2E-09	0.5%	NA	NA
Chrysene	2.1	1.1E-07	3.7E-07	7.30E-03	NA	7.7E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	1.0E-08	3.5E-08	7.30E+00	NA	7.3E-08	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	8.1E-08	2.8E-07	7.30E-01	NA	5.9E-08	4.5%	NA	NA
Aroclor-1260	0.6	3.0E-08	1.1E-07	2.00E+00	NA	6.0E-08	4.6%	NA	NA
Aluminum	29100	1.5E-03	5.1E-03	NA	1.00E+00	NA	NA	5.1E-03	48.7%
Arsenic	3.5	1.8E-07	6.2E-07	1.50E+00	3.00E-04	2.6E-07	20.2%	2.1E-03	19.5%
Chromium	65	3.3E-06	1.1E-05	NA	5.00E-03	NA	NA	2.3E-03	21.7%
Vanadium	42.2	2.1E-06	7.4E-06	NA	7.00E-03	NA	NA	1.1E-03	10.1%
					Total	1.3E-06	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	5.50E-08	1.92E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	5.50E-08	1.92E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	6.08E-08	2.13E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	4.92E-08	1.72E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	6.08E-08	2.13E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	5.79E-09	2.03E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	4.63E-08	1.62E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	1.74E-08	6.08E-08	2.22E+00	NA	3.9E-08	3.1%	NA	NA
Aluminum	29100	0.001	8.42E-05	2.95E-04	NA	1.00E-01	NA	NA	2.9E-03	11.9%
Arsenic	3.5	0.032	3.24E-07	1.13E-06	3.66E+00	1.23E-04	1.2E-06	96.9%	9.2E-03	37.1%
Chromium	65	0.001	1.88E-07	6.58E-07	NA	1.00E-04	NA	NA	6.6E-03	26.5%
Vanadium	42.2	0.001	1.22E-07	4.27E-07	NA	7.00E-05	NA	NA	6.1E-03	24.6%
Total							1.2E-06	100.0%	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	7.0E-08	NA	7.0E-08	2.8%	NA	NA	NA	NA
Benzo(a)pyrene	7.0E-07	NA	7.0E-07	27.6%	NA	NA	NA	NA
Benzo(b)fluoranthene	7.7E-08	NA	7.7E-08	3.0%	NA	NA	NA	NA
Benzo(k)fluoranthene	6.2E-09	NA	6.2E-09	0.2%	NA	NA	NA	NA
Chrysene	7.7E-10	NA	7.7E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	7.3E-08	NA	7.3E-08	2.9%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5.9E-08	NA	5.9E-08	2.3%	NA	NA	NA	NA
Aroclor-1260	6.0E-08	3.9E-08	9.9E-08	3.9%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	5.1E-03	2.9E-03	8.1E-03	22.8%
Arsenic	2.6E-07	1.2E-06	1.5E-06	57.2%	2.1E-03	9.2E-03	1.1E-02	31.9%
Chromium	NA	NA	NA	NA	2.3E-03	6.6E-03	8.9E-03	25.1%
Vanadium	NA	NA	NA	NA	1.1E-03	6.1E-03	7.2E-03	20.3%
Total	1.3E-06	1.2E-06	2.5E-06	100.0%	1.1E-02	2.5E-02	3.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (\text{C} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	1.8E-04	6.3E-04	NA	3.00E-02	NA	NA	2.1E-02	100.0%
					Total	NA	NA	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : 20 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	1.04E-04	3.63E-04	NA	2.00E-02	NA	NA	1.8E-02	100.0%
Total							NA	NA	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	2.1E-02	1.8E-02	3.9E-02	100.0%
Total	NA	NA	NA	NA	2.1E-02	1.8E-02	3.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	7.4E-04	2.6E-03	NA	3.00E-01	NA	NA	8.7E-03	100.0%
Total						NA	NA	8.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	4.28E-05	1.50E-04	NA	4.50E-02	NA	NA	3.3E-03	100.0%
Total							NA	NA	3.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	8.7E-03	3.3E-03	1.2E-02	100.0%
Total	NA	NA	NA	NA	8.7E-03	3.3E-03	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.8E-09 kg-soil/kg-wt/day
Chronic Daily Intake = : 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	1.5E-08	1.5E-07	7.30E-01	NA	1.1E-08	5.2%	NA	NA
Benzo(a)pyrene	1.75	1.5E-08	1.5E-07	7.30E+00	NA	1.1E-07	55.4%	NA	NA
Benzo(b)fluoranthene	2.05	1.8E-08	1.8E-07	7.30E-01	NA	1.3E-08	6.5%	NA	NA
Benzo(k)fluoranthene	1.6	1.4E-08	1.4E-07	7.30E-02	NA	1.0E-09	0.5%	NA	NA
Chrysene	1.9	1.7E-08	1.7E-07	7.30E-03	NA	1.2E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.13	1.1E-09	1.1E-08	7.30E+00	NA	8.4E-09	4.1%	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	1.3E-08	1.3E-07	7.30E-01	NA	9.6E-09	4.8%	NA	NA
Aroclor-1260	0.6	5.3E-09	5.3E-08	2.00E+00	NA	1.1E-08	5.2%	NA	NA
Aluminum	17390	1.5E-04	1.5E-03	NA	1.00E+00	NA	NA	1.5E-03	43.5%
Arsenic	2.8	2.5E-08	2.5E-07	1.50E+00	3.00E-04	3.7E-08	18.2%	8.2E-04	23.3%
Chromium	40.7	3.6E-07	3.6E-06	NA	5.00E-03	NA	NA	7.2E-04	20.3%
Vanadium	36	3.2E-07	3.2E-06	NA	7.00E-03	NA	NA	4.5E-04	12.9%
Total						2.0E-07	100.0%	3.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,000 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : 7 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)										
SITE NAME: NAVAL AIR STATION WHITING FIELD LOCATION: MILTON, FLORIDA SITE 6 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES MEDIA: SURFACE SOIL DATE: AUGUST 18, 1998										
CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	0.01	2.91E-09	2.91E-08	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.75	0.01	3.08E-09	3.08E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.05	0.01	3.61E-09	3.61E-08	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.6	0.01	2.82E-09	2.82E-08	NA	NA	NA	NA	NA	NA
Chrysene	1.9	0.01	3.35E-09	3.35E-08	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.13	0.01	2.29E-10	2.29E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	0.01	2.64E-09	2.64E-08	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	1.06E-09	1.06E-08	2.22E+00	NA	2.3E-09	3.9%	NA	NA
Aluminum	17390	0.001	3.06E-06	3.06E-05	NA	1.00E-01	NA	NA	3.1E-04	9.5%
Arsenic	2.8	0.032	1.58E-08	1.58E-07	3.66E+00	1.23E-04	5.8E-08	96.1%	1.3E-03	39.9%
Chromium	40.7	0.001	7.17E-09	7.17E-08	NA	1.00E-04	NA	NA	7.2E-04	22.3%
Vanadium	36	0.001	6.34E-09	6.34E-08	NA	7.00E-05	NA	NA	9.1E-04	28.2%
Total							6.0E-08	100.0%	3.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.1E-08	NA	1.1E-08	4.0%	NA	NA	NA	NA
Benzo(a)pyrene	1.1E-07	NA	1.1E-07	42.8%	NA	NA	NA	NA
Benzo(b)fluoranthene	1.3E-08	NA	1.3E-08	5.0%	NA	NA	NA	NA
Benzo(k)fluoranthene	1.0E-09	NA	1.0E-09	0.4%	NA	NA	NA	NA
Chrysene	1.2E-10	NA	1.2E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	8.4E-09	NA	8.4E-09	3.2%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	9.6E-09	NA	9.6E-09	3.7%	NA	NA	NA	NA
Aroclor-1260	1.1E-08	2.3E-09	1.3E-08	4.9%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	1.5E-03	3.1E-04	1.8E-03	27.3%
Arsenic	3.7E-08	5.8E-08	9.5E-08	36.0%	8.2E-04	1.3E-03	2.1E-03	31.3%
Chromium	NA	NA	NA	NA	7.2E-04	7.2E-04	1.4E-03	21.3%
Vanadium	NA	NA	NA	NA	4.5E-04	9.1E-04	1.4E-03	20.2%
Total	2.0E-07	6.0E-08	2.6E-07	100.0%	3.5E-03	3.2E-03	6.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.7E-07 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	3.3E-07	9.3E-07	7.30E-01	NA	2.4E-07	5.3%	NA	NA
Benzo(a)pyrene	1.9	3.3E-07	9.3E-07	7.30E+00	NA	2.4E-06	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	3.7E-07	1.0E-06	7.30E-01	NA	2.7E-07	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	3.0E-07	8.3E-07	7.30E-02	NA	2.2E-08	0.5%	NA	NA
Chrysene	2.1	3.7E-07	1.0E-06	7.30E-03	NA	2.7E-09	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	3.5E-08	9.8E-08	7.30E+00	NA	2.6E-07	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	2.8E-07	7.8E-07	7.30E-01	NA	2.0E-07	4.5%	NA	NA
Aroclor-1260	0.6	1.0E-07	2.9E-07	2.00E+00	NA	2.1E-07	4.6%	NA	NA
Aluminum	29100	5.1E-03	1.4E-02	NA	1.00E+00	NA	NA	1.4E-02	48.7%
Arsenic	3.5	6.1E-07	1.7E-06	1.50E+00	3.00E-04	9.2E-07	20.2%	5.7E-03	19.5%
Chromium	65	1.1E-05	3.2E-05	NA	5.00E-03	NA	NA	6.4E-03	21.7%
Vanadium	42.2	7.4E-06	2.1E-05	NA	7.00E-03	NA	NA	2.9E-03	10.1%
Total						4.5E-06	100.0%	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	1.53E-07	4.28E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	1.53E-07	4.28E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	1.69E-07	4.73E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	1.37E-07	3.83E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	1.69E-07	4.73E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	1.61E-08	4.50E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	1.29E-07	3.60E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	4.82E-08	1.35E-07	2.22E+00	NA	1.1E-07	3.1%	NA	NA
Aluminum	29100	0.001	2.34E-04	6.55E-04	NA	1.00E-01	NA	NA	6.5E-03	11.9%
Arsenic	3.5	0.032	9.00E-07	2.52E-06	3.66E+00	1.23E-04	3.3E-06	96.9%	2.0E-02	37.1%
Chromium	65	0.001	5.22E-07	1.46E-06	NA	1.00E-04	NA	NA	1.5E-02	26.5%
Vanadium	42.2	0.001	3.39E-07	9.50E-07	NA	7.00E-05	NA	NA	1.4E-02	24.6%
Total							3.4E-06	100.0%	5.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	2.4E-07	NA	2.4E-07	3.0%	NA	NA	NA	NA
Benzo(a)pyrene	2.4E-06	NA	2.4E-06	30.5%	NA	NA	NA	NA
Benzo(b)fluoranthene	2.7E-07	NA	2.7E-07	3.4%	NA	NA	NA	NA
Benzo(k)fluoranthene	2.2E-08	NA	2.2E-08	0.3%	NA	NA	NA	NA
Chrysene	2.7E-09	NA	2.7E-09	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	2.6E-07	NA	2.6E-07	3.2%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.0E-07	NA	2.0E-07	2.6%	NA	NA	NA	NA
Aroclor-1260	2.1E-07	1.1E-07	3.2E-07	4.0%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	1.4E-02	6.5E-03	2.1E-02	24.6%
Arsenic	9.2E-07	3.3E-06	4.2E-06	53.0%	5.7E-03	2.0E-02	2.6E-02	31.0%
Chromium	NA	NA	NA	NA	6.4E-03	1.5E-02	2.1E-02	24.8%
Vanadium	NA	NA	NA	NA	2.9E-03	1.4E-02	1.7E-02	19.5%
Total	4.5E-06	3.4E-06	7.9E-06	100.0%	2.9E-02	5.5E-02	8.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	6.3E-04	1.8E-03	NA	3.00E-02	NA	NA	5.8E-02	100.0%
					Total	NA	NA	5.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	2.88E-04	8.06E-04	NA	2.00E-02	NA	NA	4.0E-02	100.0%
Total							NA	NA	4.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.8E-02	4.0E-02	9.9E-02	100.0%
Total	NA	NA	NA	NA	5.8E-02	4.0E-02	9.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	2.6E-03	7.2E-03	NA	3.00E-01	NA	NA	2.4E-02	100.0%
Total						NA	NA	2.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	1.19E-04	3.33E-04	NA	4.50E-02	NA	NA	7.4E-03	100.0%
Total							NA	NA	7.4E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.4E-02	7.4E-03	3.2E-02	100.0%
Total	NA	NA	NA	NA	2.4E-02	7.4E-03	3.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 6.3E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	1.0E-07	8.1E-07	7.30E-01	NA	7.6E-08	5.2%	NA	NA
Benzo(a)pyrene	1.75	1.1E-07	8.6E-07	7.30E+00	NA	8.0E-07	55.4%	NA	NA
Benzo(b)fluoranthene	2.05	1.3E-07	1.0E-06	7.30E-01	NA	9.4E-08	6.5%	NA	NA
Benzo(k)fluoranthene	1.6	1.0E-07	7.8E-07	7.30E-02	NA	7.3E-09	0.5%	NA	NA
Chrysene	1.9	1.2E-07	9.3E-07	7.30E-03	NA	8.7E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.13	8.2E-09	6.4E-08	7.30E+00	NA	6.0E-08	4.1%	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	9.4E-08	7.3E-07	7.30E-01	NA	6.9E-08	4.8%	NA	NA
Aroclor-1260	0.6	3.8E-08	2.9E-07	2.00E+00	NA	7.5E-08	5.2%	NA	NA
Aluminum	17390	1.1E-03	8.5E-03	NA	1.00E+00	NA	NA	8.5E-03	43.5%
Arsenic	2.8	1.8E-07	1.4E-06	1.50E+00	3.00E-04	2.6E-07	18.2%	4.6E-03	23.3%
Chromium	40.7	2.6E-06	2.0E-05	NA	5.00E-03	NA	NA	4.0E-03	20.3%
Vanadium	36	2.3E-06	1.8E-05	NA	7.00E-03	NA	NA	2.5E-03	12.9%
					Total	1.4E-06	100.0%	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.65	0.01	9.55E-09	7.43E-08	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.75	0.01	1.01E-08	7.88E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.05	0.01	1.19E-08	9.23E-08	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.6	0.01	9.26E-09	7.20E-08	NA	NA	NA	NA	NA	NA
Chrysene	1.9	0.01	1.10E-08	8.55E-08	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.13	0.01	7.52E-10	5.85E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.5	0.01	8.68E-09	6.75E-08	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	3.47E-09	2.70E-08	2.22E+00	NA	7.7E-09	3.9%	NA	NA
Aluminum	17390	0.001	1.01E-05	7.83E-05	NA	1.00E-01	NA	NA	7.8E-04	9.5%
Arsenic	2.8	0.032	5.19E-08	4.03E-07	3.66E+00	1.23E-04	1.9E-07	96.1%	3.3E-03	39.9%
Chromium	40.7	0.001	2.36E-08	1.83E-07	NA	1.00E-04	NA	NA	1.8E-03	22.3%
Vanadium	36	0.001	2.08E-08	1.62E-07	NA	7.00E-05	NA	NA	2.3E-03	28.2%
Total							2.0E-07	100.0%	8.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	7.6E-08	NA	7.6E-08	4.6%	NA	NA	NA	NA
Benzo(a)pyrene	8.0E-07	NA	8.0E-07	48.8%	NA	NA	NA	NA
Benzo(b)fluoranthene	9.4E-08	NA	9.4E-08	5.7%	NA	NA	NA	NA
Benzo(k)fluoranthene	7.3E-09	NA	7.3E-09	0.4%	NA	NA	NA	NA
Chrysene	8.7E-10	NA	8.7E-10	0.1%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	6.0E-08	NA	6.0E-08	3.6%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	6.9E-08	NA	6.9E-08	4.2%	NA	NA	NA	NA
Aroclor-1260	7.5E-08	7.7E-09	8.3E-08	5.0%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	8.5E-03	7.8E-04	9.3E-03	33.4%
Arsenic	2.6E-07	1.9E-07	4.5E-07	27.6%	4.6E-03	3.3E-03	7.8E-03	28.2%
Chromium	NA	NA	NA	NA	4.0E-03	1.8E-03	5.8E-03	20.9%
Vanadium	NA	NA	NA	NA	2.5E-03	2.3E-03	4.8E-03	17.4%
Total	1.4E-06	2.0E-07	1.6E-06	100.0%	2.0E-02	8.2E-03	2.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day****Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	2.0E-08	5.6E-08	7.30E-01	NA	1.5E-08	5.3%	NA	NA
Benzo(a)pyrene	1.9	2.0E-08	5.6E-08	7.30E+00	NA	1.5E-07	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	2.2E-08	6.2E-08	7.30E-01	NA	1.6E-08	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	1.8E-08	5.0E-08	7.30E-02	NA	1.3E-09	0.5%	NA	NA
Chrysene	2.1	2.2E-08	6.2E-08	7.30E-03	NA	1.6E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	2.1E-09	5.9E-09	7.30E+00	NA	1.5E-08	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	1.7E-08	4.7E-08	7.30E-01	NA	1.2E-08	4.5%	NA	NA
Aroclor-1260	0.6	6.3E-09	1.8E-08	2.00E+00	NA	1.3E-08	4.6%	NA	NA
Aluminum	29100	3.1E-04	8.5E-04	NA	1.00E+00	NA	NA	8.5E-04	48.7%
Arsenic	3.5	3.7E-08	1.0E-07	1.50E+00	3.00E-04	5.5E-08	20.2%	3.4E-04	19.5%
Chromium	65	6.8E-07	1.9E-06	NA	5.00E-03	NA	NA	3.8E-04	21.7%
Vanadium	42.2	4.4E-07	1.2E-06	NA	7.00E-03	NA	NA	1.8E-04	10.1%
Total						2.7E-07	100.0%	1.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 0.6 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	2.75E-08	7.70E-08	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	2.75E-08	7.70E-08	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	3.04E-08	8.51E-08	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	2.46E-08	6.89E-08	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	3.04E-08	8.51E-08	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	2.89E-09	8.10E-09	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	2.31E-08	6.48E-08	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	8.68E-09	2.43E-08	2.22E+00	NA	1.9E-08	3.1%	NA	NA
Aluminum	29100	0.001	4.21E-05	1.18E-04	NA	1.00E-01	NA	NA	1.2E-03	11.9%
Arsenic	3.5	0.032	1.62E-07	4.54E-07	3.66E+00	1.23E-04	5.9E-07	96.9%	3.7E-03	37.1%
Chromium	65	0.001	9.40E-08	2.63E-07	NA	1.00E-04	NA	NA	2.6E-03	26.5%
Vanadium	42.2	0.001	6.11E-08	1.71E-07	NA	7.00E-05	NA	NA	2.4E-03	24.6%
Total							6.1E-07	100.0%	9.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.5E-08	NA	1.5E-08	1.6%	NA	NA	NA	NA
Benzo(a)pyrene	1.5E-07	NA	1.5E-07	16.4%	NA	NA	NA	NA
Benzo(b)fluoranthene	1.6E-08	NA	1.6E-08	1.8%	NA	NA	NA	NA
Benzo(k)fluoranthene	1.3E-09	NA	1.3E-09	0.1%	NA	NA	NA	NA
Chrysene	1.6E-10	NA	1.6E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.5E-08	NA	1.5E-08	1.7%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.2E-08	NA	1.2E-08	1.4%	NA	NA	NA	NA
Aroclor-1260	1.3E-08	1.9E-08	3.2E-08	3.6%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	8.5E-04	1.2E-03	2.0E-03	17.4%
Arsenic	5.5E-08	5.9E-07	6.5E-07	73.2%	3.4E-04	3.7E-03	4.0E-03	34.5%
Chromium	NA	NA	NA	NA	3.8E-04	2.6E-03	3.0E-03	25.8%
Vanadium	NA	NA	NA	NA	1.8E-04	2.4E-03	2.6E-03	22.4%
Total	2.7E-07	6.1E-07	8.8E-07	100.0%	1.8E-03	9.9E-03	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	3.8E-05	1.1E-04	NA	3.00E-02	NA	NA	3.5E-03	100.0%
					Total	NA	NA	3.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	5.18E-05	1.45E-04	NA	2.00E-02	NA	NA	7.3E-03	100.0%
Total							NA	NA	7.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	3.5E-03	7.3E-03	1.1E-02	100.0%
Total	NA	NA	NA	NA	3.5E-03	7.3E-03	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	1.6E-04	4.3E-04	NA	3.00E-01	NA	NA	1.4E-03	100.0%
					Total	NA	NA	1.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 0.6 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	2.14E-05	6.00E-05	NA	4.50E-02	NA	NA	1.3E-03	100.0%
Total							NA	NA	1.3E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.4E-03	1.3E-03	2.8E-03	100.0%
Total	NA	NA	NA	NA	1.4E-03	1.3E-03	2.8E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	1.5E-08	1.1E-06	7.30E-01	NA	1.1E-08	5.3%	NA	NA
Benzo(a)pyrene	1.9	1.5E-08	1.1E-06	7.30E+00	NA	1.1E-07	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	1.7E-08	1.2E-06	7.30E-01	NA	1.2E-08	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	1.4E-08	9.6E-07	7.30E-02	NA	1.0E-09	0.5%	NA	NA
Chrysene	2.1	1.7E-08	1.2E-06	7.30E-03	NA	1.2E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	1.6E-09	1.1E-07	7.30E+00	NA	1.2E-08	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	1.3E-08	9.0E-07	7.30E-01	NA	9.4E-09	4.5%	NA	NA
Aroclor-1260	0.6	4.8E-09	3.4E-07	2.00E+00	NA	9.7E-09	4.6%	NA	NA
Aluminum	29100	2.3E-04	1.6E-02	NA	1.00E+00	NA	NA	1.6E-02	48.7%
Arsenic	3.5	2.8E-08	2.0E-06	1.50E+00	3.00E-04	4.2E-08	20.2%	6.6E-03	19.5%
Chromium	65	5.2E-07	3.7E-05	NA	5.00E-03	NA	NA	7.3E-03	21.7%
Vanadium	42.2	3.4E-07	2.4E-05	NA	7.00E-03	NA	NA	3.4E-03	10.1%
Total						2.1E-07	100.0%	3.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	1.83E-09	1.28E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	1.83E-09	1.28E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	2.03E-09	1.42E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	1.64E-09	1.15E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	2.03E-09	1.42E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	1.93E-10	1.35E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	1.54E-09	1.08E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	5.79E-10	4.05E-08	2.22E+00	NA	1.3E-09	3.1%	NA	NA
Aluminum	29100	0.001	2.81E-06	1.96E-04	NA	1.00E-01	NA	NA	2.0E-03	11.9%
Arsenic	3.5	0.032	1.08E-08	7.56E-07	3.66E+00	1.23E-04	4.0E-08	96.9%	6.1E-03	37.1%
Chromium	65	0.001	6.27E-09	4.39E-07	NA	1.00E-04	NA	NA	4.4E-03	26.5%
Vanadium	42.2	0.001	4.07E-09	2.85E-07	NA	7.00E-05	NA	NA	4.1E-03	24.6%
Total							4.1E-08	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.1E-08	NA	1.1E-08	4.5%	NA	NA	NA	NA
Benzo(a)pyrene	1.1E-07	NA	1.1E-07	44.6%	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2E-08	NA	1.2E-08	4.9%	NA	NA	NA	NA
Benzo(k)fluoranthene	1.0E-09	NA	1.0E-09	0.4%	NA	NA	NA	NA
Chrysene	1.2E-10	NA	1.2E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.2E-08	NA	1.2E-08	4.7%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	9.4E-09	NA	9.4E-09	3.8%	NA	NA	NA	NA
Aroclor-1260	9.7E-09	1.3E-09	1.1E-08	4.4%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	1.6E-02	2.0E-03	1.8E-02	36.5%
Arsenic	4.2E-08	4.0E-08	8.2E-08	32.7%	6.6E-03	6.1E-03	1.3E-02	25.3%
Chromium	NA	NA	NA	NA	7.3E-03	4.4E-03	1.2E-02	23.3%
Vanadium	NA	NA	NA	NA	3.4E-03	4.1E-03	7.5E-03	14.9%
Total	2.1E-07	4.1E-08	2.6E-07	100.0%	3.4E-02	1.7E-02	5.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	2.9E-05	2.0E-03	NA	3.00E-02	NA	NA	6.7E-02	100.0%
					Total	NA	NA	6.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	3.45E-06	2.42E-04	NA	2.00E-02	NA	NA	1.2E-02	100.0%
Total						NA	NA	NA	1.2E-02	100.0%

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CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	6.7E-02	1.2E-02	7.9E-02	100.0%
Total	NA	NA	NA	NA	6.7E-02	1.2E-02	7.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	1.2E-04	8.3E-03	NA	3.00E-01	NA	NA	2.8E-02	100.0%
Total						NA	NA	2.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	1.43E-06	9.99E-05	NA	4.50E-02	NA	NA	2.2E-03	100.0%
Total							NA	NA	2.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.8E-02	2.2E-03	3.0E-02	100.0%
Total	NA	NA	NA	NA	2.8E-02	2.2E-03	3.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
na		0.0E+00	0.0E+00	7.30E-01	NA	NA	#DIV/0!	NA	NA
					Total	NA	#DIV/0!	NA	NA

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Rev. 1
09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SUBSURFACE SOIL

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
na	0	0.01	0.00E+00	0.00E+00	2.35E+00	NA	NA	#DIV/0!	NA	NA
						Total	NA	#DIV/0!	NA	NA

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CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 6
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
na	NA	NA	NA	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA	NA	NA	NA

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	2.1E-06	2.4E-05	7.30E-01	NA	1.5E-06	5.3%	NA	NA
Benzo(a)pyrene	1.9	2.1E-06	2.4E-05	7.30E+00	NA	1.5E-05	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	2.3E-06	2.7E-05	7.30E-01	NA	1.7E-06	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	1.9E-06	2.2E-05	7.30E-02	NA	1.4E-07	0.5%	NA	NA
Chrysene	2.1	2.3E-06	2.7E-05	7.30E-03	NA	1.7E-08	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	2.2E-07	2.6E-06	7.30E+00	NA	1.6E-06	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	1.8E-06	2.0E-05	7.30E-01	NA	1.3E-06	4.5%	NA	NA
Aroclor-1260	0.6	6.6E-07	7.7E-06	2.00E+00	NA	1.3E-06	4.6%	NA	NA
Aluminum	29100	3.2E-02	3.7E-01	NA	1.00E+00	NA	NA	3.7E-01	48.7%
Arsenic	3.5	3.8E-06	4.5E-05	1.50E+00	3.00E-04	5.8E-06	20.2%	1.5E-01	19.5%
Chromium	65	7.1E-05	8.3E-04	NA	5.00E-03	NA	NA	1.7E-01	21.7%
Vanadium	42.2	4.6E-05	5.4E-04	NA	7.00E-03	NA	NA	7.7E-02	10.1%
					Total	2.9E-05	100.0%	7.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose =
$$\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA adj = : 766 Skin surface available for contact (cm² year/kg)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	1.99E-07	2.33E-06	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	1.99E-07	2.33E-06	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	2.20E-07	2.57E-06	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	1.78E-07	2.08E-06	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	2.20E-07	2.57E-06	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	2.10E-08	2.45E-07	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	1.68E-07	1.96E-06	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	6.30E-08	7.35E-07	2.22E+00	NA	1.4E-07	3.1%	NA	NA
Aluminum	29100	0.001	3.05E-04	3.56E-03	NA	1.00E-01	NA	NA	3.6E-02	11.9%
Arsenic	3.5	0.032	1.18E-06	1.37E-05	3.66E+00	1.23E-04	4.3E-06	96.9%	1.1E-01	37.1%
Chromium	65	0.001	6.82E-07	7.96E-06	NA	1.00E-04	NA	NA	8.0E-02	26.5%
Vanadium	42.2	0.001	4.43E-07	5.17E-06	NA	7.00E-05	NA	NA	7.4E-02	24.6%
Total							4.4E-06	100.0%	3.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.5E-06	NA	1.5E-06	4.6%	NA	NA	NA	NA
Benzo(a)pyrene	1.5E-05	NA	1.5E-05	46.1%	NA	NA	NA	NA
Benzo(b)fluoranthene	1.7E-06	NA	1.7E-06	5.1%	NA	NA	NA	NA
Benzo(k)fluoranthene	1.4E-07	NA	1.4E-07	0.4%	NA	NA	NA	NA
Chrysene	1.7E-08	NA	1.7E-08	0.1%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.6E-06	NA	1.6E-06	4.9%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.3E-06	NA	1.3E-06	3.9%	NA	NA	NA	NA
Aroclor-1260	1.3E-06	1.4E-07	1.5E-06	4.4%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	3.7E-01	3.6E-02	4.1E-01	38.3%
Arsenic	5.8E-06	4.3E-06	1.0E-05	30.5%	1.5E-01	1.1E-01	2.6E-01	24.5%
Chromium	NA	NA	NA	NA	1.7E-01	8.0E-02	2.5E-01	23.1%
Vanadium	NA	NA	NA	NA	7.7E-02	7.4E-02	1.5E-01	14.2%
Total	2.9E-05	4.4E-06	3.3E-05	100.0%	7.6E-01	3.0E-01	1.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	3.9E-03	4.6E-02	NA	3.00E-02	NA	NA	1.5E+00	100.0%
					Total	NA	NA	1.5E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA adj = : 766 Skin surface available for contact (cm²·year/kg)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	3.76E-04	4.38E-03	NA	2.00E-02	NA	NA	2.2E-01	100.0%
Total						NA	NA	NA	2.2E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.5E+00	2.2E-01	1.7E+00	100.0%
Total	NA	NA	NA	NA	1.5E+00	2.2E-01	1.7E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	1.6E-02	1.9E-01	NA	3.00E-01	NA	NA	6.3E-01	100.0%
					Total	NA	NA	6.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj= :	766 Skin surface available for contact (cm ² year/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	1.55E-04	1.81E-03	NA	4.50E-02	NA	NA	4.0E-02	100.0%
						Total	NA	NA	4.0E-02	100.0%

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CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	6.3E-01	4.0E-02	6.7E-01	100.0%
Total	NA	NA	NA	NA	6.3E-01	4.0E-02	6.7E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	2.3E-07	8.1E-06	7.30E-01	NA	1.7E-07	5.3%	NA	NA
Benzo(a)pyrene	1.9	2.3E-07	8.1E-06	7.30E+00	NA	1.7E-06	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	2.6E-07	9.0E-06	7.30E-01	NA	1.9E-07	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	2.1E-07	7.3E-06	7.30E-02	NA	1.5E-08	0.5%	NA	NA
Chrysene	2.1	2.6E-07	9.0E-06	7.30E-03	NA	1.9E-09	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	2.4E-08	8.5E-07	7.30E+00	NA	1.8E-07	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	2.0E-07	6.8E-06	7.30E-01	NA	1.4E-07	4.5%	NA	NA
Aroclor-1260	0.6	7.3E-08	2.6E-06	2.00E+00	NA	1.5E-07	4.6%	NA	NA
Aluminum	29100	3.6E-03	1.2E-01	NA	1.00E+00	NA	NA	1.2E-01	48.7%
Arsenic	3.5	4.3E-07	1.5E-05	1.50E+00	3.00E-04	6.4E-07	20.2%	5.0E-02	19.5%
Chromium	65	7.9E-06	2.8E-04	NA	5.00E-03	NA	NA	5.6E-02	21.7%
Vanadium	42.2	5.2E-06	1.8E-04	NA	7.00E-03	NA	NA	2.6E-02	10.1%
Total						3.2E-06	100.0%	2.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA adj = : 663 Skin surface available for contact (cm²-year/kg)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	2.31E-08	8.08E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	2.31E-08	8.08E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	2.55E-08	8.93E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	2.06E-08	7.23E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	2.55E-08	8.93E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	2.43E-09	8.50E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	1.94E-08	6.80E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	7.29E-09	2.55E-07	2.22E+00	NA	1.6E-08	3.1%	NA	NA
Aluminum	29100	0.001	3.53E-05	1.24E-03	NA	1.00E-01	NA	NA	1.2E-02	11.9%
Arsenic	3.5	0.032	1.36E-07	4.76E-06	3.66E+00	1.23E-04	5.0E-07	96.9%	3.9E-02	37.1%
Chromium	65	0.001	7.89E-08	2.76E-06	NA	1.00E-04	NA	NA	2.8E-02	26.5%
Vanadium	42.2	0.001	5.12E-08	1.79E-06	NA	7.00E-05	NA	NA	2.6E-02	24.6%
Total							5.1E-07	100.0%	1.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	1.7E-07	NA	1.7E-07	4.6%	NA	NA	NA	NA
Benzo(a)pyrene	1.7E-06	NA	1.7E-06	45.9%	NA	NA	NA	NA
Benzo(b)fluoranthene	1.9E-07	NA	1.9E-07	5.1%	NA	NA	NA	NA
Benzo(k)fluoranthene	1.5E-08	NA	1.5E-08	0.4%	NA	NA	NA	NA
Chrysene	1.9E-09	NA	1.9E-09	0.1%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.8E-07	NA	1.8E-07	4.8%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.4E-07	NA	1.4E-07	3.9%	NA	NA	NA	NA
Aroclor-1260	1.5E-07	1.6E-08	1.6E-07	4.4%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	1.2E-01	1.2E-02	1.4E-01	38.0%
Arsenic	6.4E-07	5.0E-07	1.1E-06	30.9%	5.0E-02	3.9E-02	8.9E-02	24.6%
Chromium	NA	NA	NA	NA	5.6E-02	2.8E-02	8.3E-02	23.1%
Vanadium	NA	NA	NA	NA	2.6E-02	2.6E-02	5.1E-02	14.3%
Total	3.2E-06	5.1E-07	3.7E-06	100.0%	2.6E-01	1.0E-01	3.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	4.4E-04	1.5E-02	NA	3.00E-02	NA	NA	5.1E-01	100.0%
					Total	NA	NA	5.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998
HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj = :	663 Skin surface available for contact (cm ² -year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	4.35E-05	1.52E-03	NA	2.00E-02	NA	NA	7.6E-02	100.0%
Total							NA	NA	7.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.1E-01	7.6E-02	5.9E-01	100.0%
Total	NA	NA	NA	NA	5.1E-01	7.6E-02	5.9E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	1.8E-03	6.3E-02	NA	3.00E-01	NA	NA	2.1E-01	100.0%
					Total	NA	NA	2.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose =
$$\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj = :	663 Skin surface available for contact (cm ² year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	1.80E-05	6.29E-04	NA	4.50E-02	NA	NA	1.4E-02	100.0%
Total							NA	NA	1.4E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.1E-01	1.4E-02	2.2E-01	100.0%
Total	NA	NA	NA	NA	2.1E-01	1.4E-02	2.2E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	8.9E-07	2.6E-06	7.30E-01	NA	6.5E-07	5.3%	NA	NA
Benzo(a)pyrene	1.9	8.9E-07	2.6E-06	7.30E+00	NA	6.5E-06	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	9.9E-07	2.9E-06	7.30E-01	NA	7.2E-07	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	8.0E-07	2.3E-06	7.30E-02	NA	5.8E-08	0.5%	NA	NA
Chrysene	2.1	9.9E-07	2.9E-06	7.30E-03	NA	7.2E-09	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	9.4E-08	2.7E-07	7.30E+00	NA	6.9E-07	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	7.5E-07	2.2E-06	7.30E-01	NA	5.5E-07	4.5%	NA	NA
Aroclor-1260	0.6	2.8E-07	8.2E-07	2.00E+00	NA	5.6E-07	4.6%	NA	NA
Aluminum	29100	1.4E-02	4.0E-02	NA	1.00E+00	NA	NA	4.0E-02	48.7%
Arsenic	3.5	1.6E-06	4.8E-06	1.50E+00	3.00E-04	2.5E-06	20.2%	1.6E-02	19.5%
Chromium	65	3.1E-05	8.9E-05	NA	5.00E-03	NA	NA	1.8E-02	21.7%
Vanadium	42.2	2.0E-05	5.8E-05	NA	7.00E-03	NA	NA	8.3E-03	10.1%
					Total	1.2E-05	100.0%	8.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	5.18E-07	1.51E-06	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	5.18E-07	1.51E-06	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	5.72E-07	1.67E-06	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	4.63E-07	1.35E-06	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	5.72E-07	1.67E-06	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	5.45E-08	1.59E-07	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	4.36E-07	1.27E-06	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	1.63E-07	4.77E-07	2.22E+00	NA	3.6E-07	3.1%	NA	NA
Aluminum	29100	0.001	7.93E-04	2.31E-03	NA	1.00E-01	NA	NA	2.3E-02	11.9%
Arsenic	3.5	0.032	3.05E-06	8.90E-06	3.66E+00	1.23E-04	1.1E-05	96.9%	7.2E-02	37.1%
Chromium	65	0.001	1.77E-06	5.16E-06	NA	1.00E-04	NA	NA	5.2E-02	26.5%
Vanadium	42.2	0.001	1.15E-06	3.35E-06	NA	7.00E-05	NA	NA	4.8E-02	24.6%
Total							1.2E-05	100.0%	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	6.5E-07	NA	6.5E-07	2.7%	NA	NA	NA	NA
Benzo(a)pyrene	6.5E-06	NA	6.5E-06	27.4%	NA	NA	NA	NA
Benzo(b)fluoranthene	7.2E-07	NA	7.2E-07	3.0%	NA	NA	NA	NA
Benzo(k)fluoranthene	5.8E-08	NA	5.8E-08	0.2%	NA	NA	NA	NA
Chrysene	7.2E-09	NA	7.2E-09	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	6.9E-07	NA	6.9E-07	2.9%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5.5E-07	NA	5.5E-07	2.3%	NA	NA	NA	NA
Aroclor-1260	5.6E-07	3.6E-07	9.3E-07	3.9%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	4.0E-02	2.3E-02	6.3E-02	22.7%
Arsenic	2.5E-06	1.1E-05	1.4E-05	57.4%	1.6E-02	7.2E-02	8.8E-02	31.9%
Chromium	NA	NA	NA	NA	1.8E-02	5.2E-02	6.9E-02	25.1%
Vanadium	NA	NA	NA	NA	8.3E-03	4.8E-02	5.6E-02	20.3%
Total	1.2E-05	1.2E-05	2.4E-05	100.0%	8.2E-02	2.0E-01	2.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	1.7E-03	4.9E-03	NA	3.00E-02	NA	NA	1.6E-01	100.0%
					Total	NA	NA	1.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	3580	0.01	9.75E-04	2.84E-03	NA	2.00E-02	NA	NA	1.4E-01	100.0%
						Total	NA	NA	1.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.6E-01	1.4E-01	3.1E-01	100.0%
Total	NA	NA	NA	NA	1.6E-01	1.4E-01	3.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 6****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	7.0E-03	2.0E-02	NA	3.00E-01	NA	NA	6.8E-02	100.0%
					Total	NA	NA	6.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = 7.9E-05 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14800	0.001	4.03E-04	1.18E-03	NA	4.50E-02	NA	NA	2.6E-02	100.0%
Total							NA	NA	2.6E-02	100.0%

D3-355

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 6
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	6.8E-02	2.6E-02	9.4E-02	100.0%
Total	NA	NA	NA	NA	6.8E-02	2.6E-02	9.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)									
SITE NAME: NAVAL AIR STATION WHITING FIELD LOCATION: MILTON, FLORIDA SITE 6 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES MEDIA: SURFACE SOIL DATE: JULY 10, 1998									
CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	8.7E-08	8.7E-07	7.30E-01	NA	6.4E-08	5.3%	NA	NA
Benzo(a)pyrene	1.9	8.7E-08	8.7E-07	7.30E+00	NA	6.4E-07	53.3%	NA	NA
Benzo(b)fluoranthene	2.1	9.6E-08	9.6E-07	7.30E-01	NA	7.0E-08	5.9%	NA	NA
Benzo(k)fluoranthene	1.7	7.8E-08	7.8E-07	7.30E-02	NA	5.7E-09	0.5%	NA	NA
Chrysene	2.1	9.6E-08	9.6E-07	7.30E-03	NA	7.0E-10	0.1%	NA	NA
Dibenzo(a,h)anthracene	0.2	9.2E-09	9.2E-08	7.30E+00	NA	6.7E-08	5.6%	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	7.3E-08	7.3E-07	7.30E-01	NA	5.3E-08	4.5%	NA	NA
Aroclor-1260	0.6	2.7E-08	2.7E-07	2.00E+00	NA	5.5E-08	4.6%	NA	NA
Aluminum	29100	1.3E-03	1.3E-02	NA	1.00E+00	NA	NA	1.3E-02	48.7%
Arsenic	3.5	1.6E-07	1.6E-06	1.50E+00	3.00E-04	2.4E-07	20.2%	5.3E-03	19.5%
Chromium	65	3.0E-06	3.0E-05	NA	5.00E-03	NA	NA	6.0E-03	21.7%
Vanadium	42.2	1.9E-06	1.9E-05	NA	7.00E-03	NA	NA	2.8E-03	10.1%
					Total	1.2E-06	100.0%	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 6

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.9	0.01	1.74E-08	1.74E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9	0.01	1.74E-08	1.74E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1	0.01	1.92E-08	1.92E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.7	0.01	1.56E-08	1.56E-07	NA	NA	NA	NA	NA	NA
Chrysene	2.1	0.01	1.92E-08	1.92E-07	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.2	0.01	1.83E-09	1.83E-08	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.6	0.01	1.47E-08	1.47E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.6	0.01	5.50E-09	5.50E-08	2.22E+00	NA	1.2E-08	3.1%	NA	NA
Aluminum	29100	0.001	2.67E-05	2.67E-04	NA	1.00E-01	NA	NA	2.7E-03	11.9%
Arsenic	3.5	0.032	1.03E-07	1.03E-06	3.66E+00	1.23E-04	3.8E-07	96.9%	8.3E-03	37.1%
Chromium	65	0.001	5.95E-08	5.95E-07	NA	1.00E-04	NA	NA	6.0E-03	26.5%
Vanadium	42.2	0.001	3.86E-08	3.86E-07	NA	7.00E-05	NA	NA	5.5E-03	24.6%
Total							3.9E-07	100.0%	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 6
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Benzo(a)anthracene	6.4E-08	NA	6.4E-08	4.0%	NA	NA	NA	NA
Benzo(a)pyrene	6.4E-07	NA	6.4E-07	40.2%	NA	NA	NA	NA
Benzo(b)fluoranthene	7.0E-08	NA	7.0E-08	4.4%	NA	NA	NA	NA
Benzo(k)fluoranthene	5.7E-09	NA	5.7E-09	0.4%	NA	NA	NA	NA
Chrysene	7.0E-10	NA	7.0E-10	0.0%	NA	NA	NA	NA
Dibenzo(a,h)anthracene	6.7E-08	NA	6.7E-08	4.2%	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5.3E-08	NA	5.3E-08	3.4%	NA	NA	NA	NA
Aroclor-1260	5.5E-08	1.2E-08	6.7E-08	4.3%	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	1.3E-02	2.7E-03	1.6E-02	32.1%
Arsenic	2.4E-07	3.8E-07	6.2E-07	39.0%	5.3E-03	8.3E-03	1.4E-02	27.4%
Chromium	NA	NA	NA	NA	6.0E-03	6.0E-03	1.2E-02	23.9%
Vanadium	NA	NA	NA	NA	2.8E-03	5.5E-03	8.3E-03	16.6%
Total	1.2E-06	3.9E-07	1.6E-06	100.0%	2.7E-02	2.2E-02	6.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL - GRASS
DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	480 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	30 Exposure Frequency (days/year)
ED =	1 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	3.3E-04	2.3E-02	NA	1.00E+00	NA	NA	2.3E-02	57.1%
Arsenic	4.8	3.9E-08	2.7E-06	1.50E+00	3.00E-04	5.8E-08	100.0%	9.0E-03	22.0%
Vanadium	63.7	5.1E-07	3.6E-05	NA	7.00E-03	NA	NA	5.1E-03	12.5%
Chromium	30.7	2.5E-07	1.7E-05	NA	5.00E-03	NA	NA	3.5E-03	8.4%
Total						5.8E-08	100.0%	4.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL - GRASS
DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW

RELEVANT EQUATION Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:	Cs = :	Mean concentration in soil (mg/kg)
	CF = :	1.0E-06 Conversion factor (kg/mg)
	SA = :	5,750 Skin surface available for contact (cm ² /event)
	AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
		Chemical
	ABS = :	Specific Absorption factor (unitless)
	EF = :	30 Exposure frequency (events/year)
	ED = :	1 Exposure duration (years)
	BW = :	70 Body weight (kg)
	ATc = :	25,550 Averaging time for carcinogenic exposures (days)
	ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =	9.6E-08 kg-soil/kg-wt/day
Chronic Daily Intake = :	6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL - GRASS
 DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	4.01E-06	2.81E-04	NA	1.00E-01	NA	NA	2.8E-03	14.4%
Arsenic	4.8	0.032	1.48E-08	1.04E-06	3.66E+00	1.23E-04	5.4E-08	100.0%	8.4E-03	43.3%
Vanadium	63.7	0.001	6.14E-09	4.30E-07	NA	7.00E-05	NA	NA	6.1E-03	31.6%
Chromium	30.7	0.001	2.96E-09	2.07E-07	NA	1.00E-04	NA	NA	2.1E-03	10.7%
Total							5.4E-08	100.0%	1.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL - GRASS****DATE: AUGUST 21, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.3E-02	2.8E-03	2.6E-02	43.4%
Arsenic	5.8E-08	5.4E-08	1.1E-07	100.0%	9.0E-03	8.4E-03	1.7E-02	28.6%
Vanadium	NA	NA	NA	NA	5.1E-03	6.1E-03	1.1E-02	18.6%
Chromium	NA	NA	NA	NA	3.5E-03	2.1E-03	5.5E-03	9.1%
Total	5.8E-08	5.4E-08	1.1E-07	100.0%	4.1E-02	1.9E-02	6.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day****Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day**

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D3-368

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	2.1E-05	1.5E-03	NA	3.00E-02	NA	NA	5.0E-02	100.0%
					Total	NA	NA	5.0E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

R4708989

D3-370

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	0.01	2.57E-06	1.80E-04	NA	2.00E-02	NA	NA	9.0E-03	100.0%
						Total	NA	NA	9.0E-03	100.0%

09/27/99

RA708989

D3-371

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.0E-02	9.0E-03	5.9E-02	100.0%
Total	NA	NA	NA	NA	6.0E-02	9.0E-03	6.9E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION Intake = $(C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day
 Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	1.9E-04	1.4E-02	NA	3.00E-01	NA	NA	4.5E-02	100.0%
Total						NA	NA	4.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	1 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
Chronic Daily Intake = 6.8E-06 kg-soil/kg-wt/day

R4708989

D3-375

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	2.32E-06	1.63E-04	NA	4.50E-02	NA	NA	3.6E-03	100.0%
Total							NA	NA	3.6E-03	100.0%

09/27/99

R4708989

D3-376

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	4.5E-02	3.6E-03	4.9E-02	100.0%
Total	NA	NA	NA	NA	4.5E-02	3.6E-03	4.9E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION Intake = $(C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:	Cs = :	Mean concentration in soil (mg/kg)
	IR = :	480 Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06 Conversion Factor (kg/mg)
	FI = :	1 Fraction from contaminated source (unitless)
	EF = :	30 Exposure Frequency (days/year)
	ED = :	1 Exposure Duration (years)
	BW = :	70 Body Weight (kg)
	ATc = :	25,550 Averaging time for carcinogenic exposures (days)
	ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

R4708989

D3-378

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	5.9	4.8E-08	3.3E-06	1.50E+00	3.00E-04	7.1E-08	100.0%	1.1E-02	100.0%
Total						7.1E-08	100.0%	1.1E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	1 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = 6.8E-06 kg-soil/kg-wt/day

R4708889

D3-380

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	5.9	0.032	1.82E-08	1.27E-06	3.66E+00	1.23E-04	6.7E-08	100.0%	1.0E-02	100.0%
Total							6.7E-08	100.0%	1.0E-02	100.0%

09/27/99

R4708989

D3-381

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Arsenic	7.1E-08	6.7E-08	1.4E-07	100.0%	1.1E-02	1.0E-02	2.1E-02	100.0%
Total	7.1E-08	6.7E-08	1.4E-07	100.0%	1.1E-02	1.0E-02	2.1E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:	Cs = :	Mean concentration in soil (mg/kg)
	IR = :	480 Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06 Conversion Factor (kg/mg)
	FI = :	1 Fraction from contaminated source (unitless)
	EF = :	30 Exposure Frequency (days/year)
	ED = :	1 Exposure Duration (years)
	BW = :	70 Body Weight (kg)
	ATc = :	25,550 Averaging time for carcinogenic exposures (days)
	ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : **8.1E-09 kg-soil/kg-wt/day**
Chronic Daily Intake = : **5.6E-07 kg-soil/kg-wt/day**

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	21200	1.7E-04	1.2E-02	NA	3.00E-02	NA	NA	4.0E-01	100.0%
					Total	NA	NA	4.0E-01	100.0%

D3-383

CTO-0028

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW

RELEVANT EQUATION Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where	Cs =	Mean concentration in soil (mg/kg)
	CF =	1.0E-06 Conversion factor (kg/mg)
	SA =	5,750 Skin surface available for contact (cm ² /event)
	AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	ABS =	Chemical Specific Absorption factor (unitless)
	EF =	30 Exposure frequency (events/year)
	ED =	1 Exposure duration (years)
	BW =	70 Body weight (kg)
	ATc =	25,550 Averaging time for carcinogenic exposures (days)
	ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = 6.8E-06 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	21200	0.01	2.04E-05	1.43E-03	NA	2.00E-02	NA	NA	7.2E-02	100.0%
						Total	NA	NA	7.2E-02	100.0%

D3-385

CTO-0028

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D3-386

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.0E-01	7.2E-02	4.7E-01	100.0%
Total	NA	NA	NA	NA	4.0E-01	7.2E-02	4.7E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	2.0E-02	5.7E-02	NA	1.00E+00	NA	NA	5.7E-02	57.1%
Arsenic	4.8	2.3E-06	6.6E-06	1.50E+00	3.00E-04	3.4E-06	100.0%	2.2E-02	22.0%
Vanadium	63.7	3.0E-05	8.7E-05	NA	7.00E-03	NA	NA	1.2E-02	12.5%
Chromium	30.7	1.4E-05	4.2E-05	NA	5.00E-03	NA	NA	8.4E-03	8.4%
Total						3.4E-06	100.0%	1.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL - GRASS
 DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

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CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	1.13E-03	3.31E-03	NA	1.00E-01	NA	NA	3.3E-02	14.4%
Arsenic	4.8	0.032	4.18E-06	1.22E-05	3.66E+00	1.23E-04	1.5E-05	100.0%	9.9E-02	43.3%
Vanadium	63.7	0.001	1.74E-06	5.06E-06	NA	7.00E-05	NA	NA	7.2E-02	31.6%
Chromium	30.7	0.001	8.36E-07	2.44E-06	NA	1.00E-04	NA	NA	2.4E-02	10.7%
Total							1.5E-05	100.0%	2.3E-01	100.0%

09/27/99

R4708989

D3-391

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL - GRASS
DATE: AUGUST 21, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.7E-02	3.3E-02	9.0E-02	27.4%
Arsenic	3.4E-06	1.5E-05	1.9E-05	100.0%	2.2E-02	9.9E-02	1.2E-01	36.8%
Vanadium	NA	NA	NA	NA	1.2E-02	7.2E-02	8.5E-02	25.8%
Chromium	NA	NA	NA	NA	8.4E-03	2.4E-02	3.3E-02	10.0%
Total	3.4E-06	1.5E-05	1.9E-05	100.0%	1.0E-01	2.3E-01	3.3E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	1.2E-03	3.6E-03	NA	3.00E-02	NA	NA	1.2E-01	100.0%
					Total	NA	NA	1.2E-01	100.0%

D3-393

CTO-0028

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	0.01	7.25E-04	2.11E-03	NA	2.00E-02	NA	NA	1.1E-01	100.0%
						Total	NA	NA	1.1E-01	100.0%

D3-395

CTO-0028

09/27/99

R4708989

D3-396

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.2E-01	1.1E-01	2.3E-01	100.0%
Total	NA	NA	NA	NA	1.2E-01	1.1E-01	2.3E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day**

R4708989

D3-398

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	1.1E-02	3.3E-02	NA	3.00E-01	NA	NA	1.1E-01	100.0%
					Total	NA	NA	1.1E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

R4708989

D3-400

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	6.57E-04	1.91E-03	NA	4.50E-02	NA	NA	4.3E-02	100.0%
Total							NA	NA	4.3E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.1E-01	4.3E-02	1.5E-01	100.0%
Total	NA	NA	NA	NA	1.1E-01	4.3E-02	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL - GRASS AREA
DATE: AUGUST 24, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	50 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	234 Exposure Frequency (days/year)
ED =	7 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL - GRASS AREA

DATE: AUGUST 24, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	23767	1.1E-03	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	49.9%
Arsenic	3.9	1.8E-07	1.8E-06	1.50E+00	3.00E-04	2.7E-07	100.0%	6.0E-03	27.3%
Vanadium	46.3	2.1E-06	2.1E-05	NA	7.00E-03	NA	NA	3.0E-03	13.9%
Chromium	21.4	9.8E-07	9.8E-06	NA	5.00E-03	NA	NA	2.0E-03	9.0%
					Total	2.7E-07	100.0%	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL - GRASS AREA
DATE: AUGUST 24, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,000 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : 7 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL - GRASS AREA
 DATE: AUGUST 24, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	23767	0.001	2.18E-05	2.18E-04	NA	1.00E-01	NA	NA	2.2E-03	11.2%
Arsenic	3.9	0.032	1.14E-07	1.14E-06	3.66E+00	1.23E-04	4.2E-07	100.0%	9.3E-03	47.7%
Vanadium	46.3	0.001	4.24E-08	4.24E-07	NA	7.00E-05	NA	NA	6.1E-03	31.1%
Chromium	21.4	0.001	1.96E-08	1.96E-07	NA	1.00E-04	NA	NA	2.0E-03	10.1%
Total							4.2E-07	100.0%	1.9E-02	100.0%

R4708989

D3-405

CTO-0028

09/27/99

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL - GRASS AREA
 DATE: AUGUST 24, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.1E-02	2.2E-03	1.3E-02	31.6%
Arsenic	2.7E-07	4.2E-07	6.9E-07	100.0%	6.0E-03	9.3E-03	1.5E-02	36.9%
Vanadium	NA	NA	NA	NA	3.0E-03	6.1E-03	9.1E-03	22.0%
Chromium	NA	NA	NA	NA	2.0E-03	2.0E-03	3.9E-03	9.5%
Total	2.7E-07	4.2E-07	6.9E-07	100.0%	2.2E-02	1.9E-02	4.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

R4708989

D3-408

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Dose Intake (mg/kg/day)	Chronic Dose Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	4.6E-02	5.3E-01	NA	1.00E+00	NA	NA	5.3E-01	57.1%
Arsenic	4.8	5.3E-06	6.1E-05	1.50E+00	3.00E-04	7.9E-06	100.0%	2.0E-01	22.0%
Vanadium	63.7	7.0E-05	8.1E-04	NA	7.00E-03	NA	NA	1.2E-01	12.5%
Chromium	30.7	3.4E-05	3.9E-04	NA	5.00E-03	NA	NA	7.9E-02	8.4%
Total						7.9E-06	100.0%	9.3E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose =
$$\frac{Cs \times CF \times SA_{adj} \times AF \times ABS \times EF}{AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA _{adj} = :	766 Age-weighted skin surface available for contact (cm ² -yr/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ² -event)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
AT _c = :	25,550 Averaging time for carcinogenic exposures (days)
AT _n = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intal 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

R4708989

D3-410

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL - GRASS

DATE: AUGUST 21, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Dose Intake (mg/kg/day)	Chronic Dose Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	4.37E-04	5.09E-03	NA	1.00E-01	NA	NA	5.1E-02	14.4%
Arsenic	4.8	0.032	1.61E-06	1.88E-05	3.66E+00	1.23E-04	5.9E-06	100.0%	1.5E-01	43.3%
Vanadium	63.7	0.001	6.68E-07	7.80E-06	NA	7.00E-05	NA	NA	1.1E-01	31.6%
Chromium	30.7	0.001	3.22E-07	3.76E-06	NA	1.00E-04	NA	NA	3.8E-02	10.7%
Total							5.9E-06	100.0%	3.5E-01	100.0%

09/27/99

R4708989

D3-411

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL - GRASS****DATE: AUGUST 21, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.3E-01	5.1E-02	5.8E-01	45.4%
Arsenic	7.9E-06	5.9E-06	1.4E-05	100.0%	2.0E-01	1.5E-01	3.6E-01	27.8%
Vanadium	NA	NA	NA	NA	1.2E-01	1.1E-01	2.3E-01	17.7%
Chromium	NA	NA	NA	NA	7.9E-02	3.8E-02	1.2E-01	9.0%
Total	7.9E-06	5.9E-06	1.4E-05	100.0%	9.3E-01	3.6E-01	1.3E+00	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

R4708989

D3-413

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)									
SITE NAME: NAVAL AIR STATION WHITING FIELD									
LOCATION: MILTON, FLORIDA SITE 30									
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES									
MEDIA: SURFACE SOIL									
DATE: JULY 28, 1998									
CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	2.9E-03	3.4E-02	NA	3.00E-02	NA	NA	1.1E+00	100.0%
					Total	NA	NA	1.1E+00	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL
 DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 766 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

R4708989

D3-415

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	0.01	2.79E-04	3.26E-03	NA	2.00E-02	NA	NA	1.6E-01	100.0%
Total							NA	NA	1.6E-01	100.0%

09/2/99

R4708989

D3-416

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.1E+00	1.6E-01	1.3E+00	100.0%
Total	NA	NA	NA	NA	1.1E+00	1.6E-01	1.3E+00	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION Intake = $\frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

R4708989

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	2.6E-02	3.1E-01	NA	3.00E-01	NA	NA	1.0E+00	100.0%
					Total	NA	NA	1.0E+00	100.0%

D3-418

CTO-0028

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

R4708989

D3-420

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	2.53E-04	2.95E-03	NA	4.50E-02	NA	NA	6.6E-02	100.0%
Total						NA	NA	NA	6.6E-02	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.0E+00	6.6E-02	1.1E+00	100.0%
Total	NA	NA	NA	NA	1.0E+00	6.6E-02	1.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL - GRASS AREA****DATE: AUGUST 24, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)									
SITE NAME: NAVAL AIR STATION WHITING FIELD LOCATION: MILTON, FLORIDA SITE 30 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES MEDIA: SURFACE SOIL - GRASS AREA DATE: AUGUST 24, 1998									
CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	23767	2.9E-03	1.0E-01	NA	1.00E+00	NA	NA	1.0E-01	49.9%
Arsenic	3.9	4.8E-07	1.7E-05	1.50E+00	3.00E-04	7.1E-07	100.0%	5.6E-02	27.3%
Vanadium	46.3	5.7E-06	2.0E-04	NA	7.00E-03	NA	NA	2.8E-02	13.9%
Chromium	21.4	2.6E-06	9.1E-05	NA	5.00E-03	NA	NA	1.8E-02	9.0%
Total						7.1E-07	100.0%	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL - GRASS AREA
 DATE: AUGUST 24, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	663 Age-weighted skin surface available for contact (cm ² -yr/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ² -event)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL - GRASS AREA
 DATE: AUGUST 24, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	23767	0.001	2.89E-05	1.01E-03	NA	1.00E-01	NA	NA	1.0E-02	11.2%
Arsenic	3.9	0.032	1.52E-07	5.30E-06	3.66E+00	1.23E-04	5.5E-07	100.0%	4.3E-02	47.7%
Vanadium	46.3	0.001	5.62E-08	1.97E-06	NA	7.00E-05	NA	NA	2.8E-02	31.1%
Chromium	21.4	0.001	2.60E-08	9.10E-07	NA	1.00E-04	NA	NA	9.1E-03	10.1%
Total							5.5E-07	100.0%	9.0E-02	100.0%

R4708989

D3-426

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL - GRASS AREA
DATE: AUGUST 24, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.0E-01	1.0E-02	1.1E-01	38.0%
Arsenic	7.1E-07	5.5E-07	1.3E-06	100.0%	5.6E-02	4.3E-02	9.9E-02	33.6%
Vanadium	NA	NA	NA	NA	2.8E-02	2.8E-02	5.6E-02	19.2%
Chromium	NA	NA	NA	NA	1.8E-02	9.1E-03	2.7E-02	9.3%
Total	7.1E-07	5.5E-07	1.3E-06	100.0%	2.0E-01	9.0E-02	2.9E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

R4708989

D3-428

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	3.2E-04	1.1E-02	NA	3.00E-02	NA	NA	3.8E-01	100.0%
					Total	NA	NA	3.8E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION	Absorbed Dose =	$\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$
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Where:	Cs = :	Mean concentration in soil (mg/kg)
	CF = :	1.0E-06 Conversion factor (kg/mg)
	SA = :	663 Skin surface available for contact (cm ² /event)
	AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	ABS = :	Absorption factor (unitless)
	EF = :	234 Exposure frequency (events/year)
	ED = :	Exposure duration (years)
	BW = :	Body weight (kg)
	ATc = :	25,550 Averaging time for carcinogenic exposures (days)
	ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

R4708989

D3-430

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2660	0.01	1.62E-04	1.13E-03	NA	2.00E-02	NA	NA	5.7E-02	100.0%
						Total	NA	NA	5.7E-02	100.0%

09/27/99

R4708989

D3-431

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	3.8E-01	5.7E-02	4.4E-01	100.0%
Total	NA	NA	NA	NA	3.8E-01	5.7E-02	4.4E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION	Intake = $\frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$
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WHERE

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day**

R4708989

D3-433

CTO-0028

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	16823	2.1E-03	7.2E-02	NA	3.00E-01	NA	NA	2.4E-01	100.0%
					Total	NA	NA	2.4E-01	100.0%

09/27/99

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 663 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

R4708989

D3-435

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	16823	0.001	1.02E-04	7.15E-04	NA	4.50E-02	NA	NA	1.6E-02	100.0%
Total							NA	NA	1.6E-02	100.0%

09/27/99

R4708889

D3-436

CTO-0028

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.4E-01	1.6E-02	2.6E-01	100.0%
Total	NA	NA	NA	NA	2.4E-01	1.6E-02	2.6E-01	100.0%

09/27/99

SITE 32

- A thick concrete layer prevents surface soil exposure and no COPCs were found in subsurface soil; therefore, no risk calculations are provided in this section.
- Risk Calculations for the Hypothetical Future Conditions assuming removal of the concrete and asphalt pavement at Sites 30, 32, and 33 are included in Appendix D9.

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	7.3	5.9E-08	4.1E-06	1.50E+00	3.00E-04	8.8E-08	100.0%	1.4E-02	100.0%
Total						8.8E-08	100.0%	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SUBSURFACE SOIL
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Arsenic	7.3	0.032	2.25E-08	1.58E-06	3.66E+00	1.23E-04	8.2E-08	100.0%	1.3E-02	100.0%
Total							8.2E-08	100.0%	1.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Arsenic	8.8E-08	8.2E-08	1.7E-07	100.0%	1.4E-02	1.3E-02	2.7E-02	100.0%
Total	8.8E-08	8.2E-08	1.7E-07	100.0%	1.4E-02	1.3E-02	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SUBSURFACE SOIL****DATE: SEPTEMBER 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: SEPTEMBER 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	7790	6.3E-05	4.4E-03	NA	3.00E-02	NA	NA	1.5E-01	100.0%
					Total	NA	NA	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: SEPTEMBER 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: SEPTEMBER 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	7790	0.01	7.51E-06	5.26E-04	NA	2.00E-02	NA	NA	2.6E-02	100.0%
						Total	NA	NA	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SUBSURFACE SOIL
DATE: SEPTEMBER 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.5E-01	2.6E-02	1.7E-01	100.0%
Total	NA	NA	NA	NA	1.5E-01	2.6E-02	1.7E-01	100.0%

APPENDIX D4
TOXICITY PROFILES

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D.4.1 ALUMINUM

D.4.1.1 Noncancer Toxicity

Aluminum is not generally regarded as an industrial poison. Inhalation of finely divided powder has been reported as a cause of pulmonary fibrosis. Aluminum in aerosols has been implicated in Alzheimer's disease. As with other metals, the powder and dust are the most dangerous forms (Sax and Lewis, 1989). Most hazardous exposures to aluminum occur in refining and smelting processes. Aluminum dust is a respiratory and eye irritant. EPA presented an oral RfD of 1.00 mg/kg/day and an inhalation reference dose of 0.001 mg/kg/day (EPA, 1998).

D.4.1.2 Carcinogenicity

Data were not located regarding the carcinogenicity of aluminum to humans. No oral or inhalation cancer slope factor is available for aluminum.

D.4.2 ANTIMONY

Antimony enters the environment during the mining and processing of its ores and other related compounds. Small amounts of antimony are also released into the environment by incinerators and coal burning power plants. Antimony will strongly adhere to soil which contains iron, manganese, or aluminum. Antimony was used for medicinal purposes to treat people infected with parasites. However, chronic exposure can cause eye, skin, and lung irritation, as well as heart problems, vomiting and diarrhea. The oral RfD, based on an oral drinking water study in rats, showed changes in glucose and cholesterol metabolism. Antimony has not been evaluated by the USEPA for evidence of human carcinogenic potential (ATSDR, 1991; EPA, 1993a).

D.4.3 ARSENIC

D.4.3.1 Pharmacokinetics

Several studies confirm that soluble inorganic arsenic compounds and organic arsenic compounds are almost completely (>90 percent) absorbed from the GI tract in both animals and humans (Ishinishi et al. 1986). The absorption efficiency of insoluble inorganic arsenic compounds depends on particle size and stomach pH. Initial distribution of absorbed arsenic is to the liver, kidneys, and lungs, followed by redistribution to hair, nails, teeth, bone, and skin, which are considered tissues of accumulation. Arsenic has

a longer half-life in the blood of rats, compared with other animals and humans, because of firm binding to the hemoglobin in erythrocytes.

Metabolism of inorganic arsenic includes reversible oxidation-reduction so that both arsenite (valence of 3) and arsenate (valence of 5) are present in the urine of animals treated with arsenic of either valence (Ishinishi et al. 1986). Arsenite is subsequently oxidized and methylated by a saturable mechanism to form mono- or dimethylarsenate; the latter is the predominant metabolite in the urine of animals or humans. Organic arsenic compounds (arsenilic acid, cacodylic acid) are not readily converted to inorganic arsenic. Excretion of organic or inorganic arsenic is largely via the urine, but considerable species variation exists. Continuously exposed humans appear to excrete 60 to 70 percent of their daily intake of arsenate or arsenite via the urine.

D.4.3.2 Noncancer Toxicity

A lethal dose of arsenic trioxide in humans is 70 to 180 mg (approximately 50 to 140 mg arsenic; Ishinishi et al. 1986). Acute oral exposure of humans to high doses of arsenic produce liver swelling, skin lesions, disturbed heart function, and neurological effects. The only noncancer effects in humans clearly attributable to chronic oral exposure to arsenic are dermal hyperpigmentation and keratosis, as revealed by studies of several hundred Chinese exposed to naturally occurring arsenic in well water (Tseng 1977; Tseng et al. 1968; EPA 1998). Similar effects were observed in persons exposed to high levels of arsenic in water in Utah and the northern part of Mexico (Cebrian et al. 1983; Southwick et al. 1983). Occupational (predominantly inhalation) exposure is also associated with neurological deficits, anemia, and cardiovascular effects (Ishinishi et al. 1986), but concomitant exposure to other chemicals cannot be ruled out. The EPA (1998) derived an RfD of $3.0\text{E-}04$ mg/kg-day for chronic oral exposure, based on an NOAEL of 0.8 mg/kg-day for skin lesions from the Chinese data. The principal target organ for arsenic appears to be the skin. The nervous system and cardiovascular systems appear to be less significant target organs. Inorganic arsenic may be an essential nutrient, exerting beneficial effects on growth, health, and feed conversion efficiency (Underwood 1977).

D.4.3.3 Carcinogenicity

Inorganic arsenic is clearly a carcinogen in humans. Inhalation exposure is associated with increased risk of lung cancer in persons employed as smelter workers, in arsenical pesticide applicators, and in a population residing near a pesticide manufacturing plant (EPA 1998). Oral exposure to high levels in well water is associated with increased risk of skin cancer (Tseng 1977; EPA 1998). Extensive animal testing with various forms of arsenic given by many routes of exposure to several species, however, has not

demonstrated the carcinogenicity of arsenic (International Agency for Research on Cancer [IARC] 1980). The EPA (1997) classifies inorganic arsenic in cancer weight-of-evidence Group A (human carcinogen), and recommends an oral unit risk of 0.00005 mg/L in drinking water, based on the incidence of skin cancer in the Tseng (1977) study. The EPA (1998) notes that the uncertainties associated with the oral unit risk are considerably less than those for most carcinogens, so that the unit risk might be reduced an order of magnitude. An inhalation unit risk of 0.0043 per mg/m³ was derived for inorganic arsenic from the incidence of lung cancer in occupationally exposed men (EPA 1998). The current oral slope factor for arsenic is 1.5 (mg/kg-day)⁻¹ and the inhalation slope factor is 15.1 (mg/kg-day)⁻¹ (EPA 1998).

D.4.4 BENZO(A)ANTHRACENE

D.4.4.1 Noncancer Toxicity

The oral and inhalation RfD and RfC are not available at this time (EPA 1998).

D.4.4.2 Carcinogenicity

Benzo[a]anthracene has a weight of evidence classification of B2, a probable human carcinogen. The classification was based on sufficient data from animal bioassays. Benzo[a]anthracene produced tumors in mice exposed by gavage; intraperitoneal, subcutaneous or intramuscular injection; and topical application. Benzo[a]anthracene produced mutations in bacteria and in mammalian cells, and transformed mammalian cells in culture.

Although there are no human data that specifically link exposure to benzo[a]anthracene to human cancers, benzo[a]anthracene is a component of mixtures that have been associated with human cancer. These include coal tar, soot, coke oven emissions and cigarette smoke (U.S. EPA, 1984, 1990; IARC, 1984; Lee et al., 1976; Brockhaus and Tomingas, 1976).

Benzo[a]anthracene administration caused an increase in the incidence of tumors by gavage (Klein, 1963); dermal application (IARC, 1973); and both subcutaneous injection (Steiner and Faulk, 1951; Steiner and Edgecomb, 1952) and intraperitoneal injection (Wislocki et al., 1986) assays. A group of male mice was exposed to gavage solutions containing 3% benzo[a]anthracene for 5 weeks. There was an increased incidence of pulmonary adenomas and hepatomas.

Supporting data for carcinogenicity include genetic mutations in five different strains of Salmonella typhimurium. Benzo[a]anthracene produced positive results in an assay for mutations in Drosophila melongaster (Fahmy and Fahmy, 1973).

The currently used Oral Slope Factor (CSF) for Benzo[a]anthracene is 7.3E-01 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.1×7.3 (BaP) = 7.3E-01 per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

The inhalation CSF is not available.

D.4.5 BENZO(A)PYRENE (BAP)

D.4.5.1 Pharmacokinetics

Benzo(a)pyrene was readily absorbed across the GI (Rees et al. 1971) and respiratory epithelia (Kotin et al. 1969; Vainich et al. 1976). Benzo(a)pyrene was distributed widely in the tissues of treated rats and mice, but primarily to tissues high in fat, such as adipose tissue and mammary gland (Kotin et al. 1969; Schlede et al. 1970a).

Studies of the metabolism of benzo(a)pyrene provide information relevant to other PAHs because of the structural similarities of all members of the class. Metabolism involves microsomal mixed function oxidase hydroxylation of one or more of the phenyl rings with the formation of phenols and dihydrodiols, probably via formation of arene oxide intermediates (EPA 1979a). The dihydrodiols may be further oxidized to diol epoxides, which, for certain members of the class, are known to be the ultimate carcinogens (LaVoie et al. 1982). Conjugation with glutathione or glucuronic acid, and reduction to tetrahydrotetrols are important detoxification pathways.

Excretion of benzo(a)pyrene residue was reported to be rapid, although quantitative data were not located (EPA 1979b). Excretion occurred mainly via the feces, probably largely due to biliary secretion (Schlede et al. 1970a, 1970b). The EPA (1980a) concluded that accumulation in the body tissues of PAHs from chronic low level exposure would be unlikely.

D.4.5.2 Noncancer Toxicity

The oral RfD and inhalation RfC are not available at this time.

D.4.5.3 Carcinogenicity

The PAHs are ubiquitous, being released to the environment from anthropogenic as well as from natural sources (ATSDR 1987). Benzo(a)pyrene is the most extensively studied member of the class, inducing tumors in multiple tissues of virtually all laboratory species tested by all routes of exposure. Although epidemiology studies suggested that complex mixtures that contain PAHs (coal tar, soots, coke oven emissions, cigarette smoke) are carcinogenic to humans (EPA 1994), the carcinogenicity cannot be attributed to PAHs alone because of the presence of other potentially carcinogenic substances in these mixtures (ATSDR 1987). In addition, recent investigations showed that the PAH fraction of roofing tar, cigarette smoke, and coke oven emissions accounted for only 0.1 to 8 percent of the total mutagenic activity of the unfractionated complex mixture in Salmonella (Lewtas 1988). Aromatic amines, nitrogen heterocyclic compounds, highly oxygenated quinones, diones, and nitrooxygenated compounds, none of which would be expected to arise from in vivo metabolism of PAHs, probably accounted for the majority of the mutagenicity of coke oven emissions and cigarette smoke. Coal tar, which contains a mixture of many PAHs, has a long history of use in the clinical treatment of a variety of skin disorders in humans (ATSDR 1987).

Because of the lack of human cancer data, assignment of individual PAHs to EPA cancer weight-of-evidence groups was based largely on the results of animal studies with large doses of purified compound (EPA 1994). Frequently, unnatural routes of exposure, including implants of the test chemical in beeswax and trioctanoin in the lungs of female Osborne-Mendel rats, intratracheal instillation, and subcutaneous or intraperitoneal injection, were used. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were classified in Group B2 (probable human carcinogens).

The EPA (1998) verified a slope factor for oral exposure to benzo(a)pyrene of 7.3 per mg/kg/day, based on several dietary studies in mice and rats. Neither verified nor provisional quantitative risk estimates were available for the other PAHs in Group B2. The EPA (1980) promulgated an ambient water quality criterion for "total carcinogenic PAHs," based on an oral slope factor derived from a study with benzo(a)pyrene, as being sufficiently protective for the class. Largely because of this precedent, the quantitative risk estimates for benzo(a)pyrene were adopted for the other carcinogenic PAHs when quantitative estimates were needed.

Human data specifically linking benzo(a)pyrene (BAP) to a carcinogenic effect are lacking. There are, however, multiple animal studies in many species demonstrating BAP to be carcinogenic following administration by numerous routes. In addition, BAP has produced positive results in numerous genotoxicity assays.

The data for animal carcinogenicity were sufficient. The animal data consist of dietary, gavage, inhalation, intratracheal instillation, dermal and subcutaneous studies in numerous strains of at least four species of rodents and several primates. Repeated BAP administration has been associated with increased incidences of total tumors and of tumors at the site of exposure. The tumor types in mice from oral diet studies include forestomach, squamous cell papillomas, and carcinomas (Neal and Rigdon 1967).

Benzo(a)pyrene has been shown to cause genotoxic effects in a broad range of prokaryotic and mammalian cell assay systems (EPA 1991a).

The oral slope factor presented in the Region III Risk-Based Concentration Table is 7.3E+0 per mg/kg/day. The cancer slope factor for inhalation is not available.

D.4.6 BENZO(B)FLUORANTHENE

D.4.6.1 Noncancer Toxicity

Little information is available on benzo(b)fluoranthene. However, based on the similarities of chemical structures, most properties should be similar to benzo(a)pyrene.

D.4.6.2 Carcinogenicity

The EPA (1997) has classified benzo(b)fluoranthene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on lung tumors in mice. The currently used Oral Slope Factor (CSF) for benzo(b)fluoranthene is 7.3E-01 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.1×7.3 (BaP) = 7.3E-01 per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

D.4.7 BENZO(K)FLUORANTHENE

D.4.7.1 Noncancer Toxicity

Little information is available on benzo(k)fluoranthene. However, based on the similarities of the chemical structures, most properties should be similar to benzo(a)pyrene.

D.4.7.2 Carcinogenicity

The EPA (1997) has classified benzo(k)fluoranthene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on lung tumors in mice. The currently used Oral Slope Factor (CSF) for benzo(k)fluoranthene is $7.3\text{E-}02$ per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.01×7.3 (BaP) = $7.3\text{E-}02$ per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

D.4.8 CHROMIUM

D.4.8.1 Noncancer Toxicity

In nature, chromium (III) predominates over chromium (VI) (Langård and Norseth 1986). Little chromium (VI) exists in biological materials, except shortly after exposure, because reduction to chromium (III) occurs rapidly. Chromium (III) is considered a nutritionally essential trace element and is considerably less toxic than chromium (VI). No effects were observed in rats consuming 5% chromium (III)/kg/day in the diet for over two years (EPA 1997). The NOEL of 5% Cr_2O_3 was the basis for a verified chronic oral RfD of 1 mg/kg/day (EPA 1997). The same NOEL and an uncertainty factor of 1000 were the basis for a provisional subchronic oral RfD of 1 mg/kg/day (EPA 1997).

Acute oral exposure of humans to high doses of chromium (VI) induced neurological effects, GI hemorrhage and fluid loss, and kidney and liver effects. Parenteral dosing of animals with chromium (VI) is selectively toxic to the kidney tubules. An NOAEL of 2.4 mg chromium (VI) /kg/day in a one-year drinking water study in rats and an uncertainty factor of 500 was the basis of a verified RfD of 0.005 mg/kg/day for chronic oral exposure (EPA 1998). The same NOAEL and an uncertainty factor of 100 were the basis of a provisional subchronic oral RfD of 0.02 mg/kg/day (EPA 1997).

Occupational (inhalation and dermal) exposure to chromium (III) compounds induced dermatitis (ACGIH 1991). Similar exposure to chromium (VI) induced ulcerative and allergic contact dermatitis, irritation of the upper respiratory tract including ulceration of the mucosa and perforation of the nasal septum, and possibly kidney effects. Inhalation RfC values were not located.

A target organ was not identified for chromium (III). The kidney appears to be the principal target organ for repeated oral dosing with chromium (VI). Additional target organs for dermal and inhalation exposure include the skin and respiratory tract.

D.4.8.2 Carcinogenicity

Data were not located regarding the carcinogenicity of chromium (III). The EPA (1998) classifies chromium (VI) in cancer weight-of-evidence Group A (human carcinogen), based on the consistent observation of increased risk of lung cancer in occupational studies of workers in chromate production or the chrome pigment industry. Parenteral dosing of animals with chromium (VI) compounds consistently induced injection-site tumors. There is no evidence that oral exposure to chromium (VI) induces cancer. An inhalation unit risk of 0.012 per mg/m³, equivalent to 41 per mg/kg/day, assuming humans inhale 20 m³/day and weigh 70 kg, was based on increased risk of lung cancer deaths in chromate production workers.

D.4.9 CHRYSENE

D.4.9.1 Noncancer Toxicity

Chrysene is absorbed by the oral route of exposure. Absorption may also occur following dermal exposure. Data are not available to determine whether chrysene is absorbed via the lungs. Absorbed chrysene is distributed to several tissues, i.e., it was found in all five tissues in a study reported in 1983. It is accumulated preferentially in the adipose and mammary tissue.

There is no information on other toxic effects of chrysene in human and laboratory animals following inhalation, oral, and dermal exposures (ATSDR 1987, draft).

D.4.9.2 Carcinogenicity

The EPA (1997) has classified chrysene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on tumors and malignant lymphoma in mice and chromosomal abnormalities in hamsters. The currently used Oral Slope Factor (CSF) for chrysene is 7.3E-03 per (mg/kg)/day which is extrapolated from the CSF for Benzo(a)pyrene (BaP), i.e., 0.001 x 7.3 (BaP) = 7.3E-03 per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

D.4.10 DIBENZO(A, H)ANTHRACENE

D.4.10.1 Noncancer Toxicity

The oral RfD and inhalation RfC are not available.

D.4.10.2 Carcinogenicity

Classification – B2; probable human carcinogen

The EPA (1997) has classified dibenzo(a,h)anthracene in cancer weight-of-evidence group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals). Based on carcinomas in mice following oral or dermal exposure and injection site tumors in several species following subcutaneous or intramuscular administration. Dibenzo(a,h)anthracene has induced DNA damage and gene mutations in bacteria as well as gene mutations and transformation in several types of mammalian cell cultures.

Although there are no human data that specifically link exposure to dibenzo(a,h)anthracene with human cancers, dibenzo(a,h)anthracene is a component of mixtures that have been associated with human cancer. These include coal tar, soot, coke oven emissions and cigarette smoke (EPA, 1984, 1990; IARC, 1984).

Dibenzo(a,h)anthracene has been shown to be carcinogenic when administered to mice by the oral route (Snell and Stewart, 1962, 1963) in a water-olive oil emulsion. Mice developed pulmonary adenomas, pulmonary carcinomas, and mammary carcinomas.

Dibenzo(a,h)anthracene has produced positive results in bacterial DNA damage and mutagenicity assays and in mammalian cell DNA damage, mutagenicity and cell transformation assays.

The currently used Oral Slope Factor (CSF) for Dibenzo(a,h)anthracene is 7.3×10^0 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene, i.e., 1.0×7.3 (BaP) = 7.3 per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

The inhalation Cancer Slope Factor for dibenzo(a,h)anthracene is not available.

D.4.11 DIELDRIN

D.4.11.1 Noncancer Toxicity

The EPA (1998) derived an RfD of 5×10^{-5} mg/kg/day for chronic oral exposure based on a NOAEL of 0.005 mg/kg/day for liver lesions in a two-year rat feeding study (Walker et al., 1969) with an uncertainty factor of 100. The LOAEL was identified as 0.05 mg/kg/day.

At the end of two years the rats had increased liver weights and histopathological examinations revealed liver parenchymal cell changes. These hepatic lesions were considered to be characteristic of exposure to an organochlorine insecticide.

The chronic inhalation RfC is not available at this time.

D.4.11.2 Carcinogenicity

EPA (1997) classifies dieldrin in cancer weight-of-evidence B2. Dieldrin is carcinogenic in seven strains of mice when administered orally. Dieldrin is structurally related to compounds (aldrin, chlordane, heptachlor, heptachlor epoxide, and chlorendic acid) which produce tumors in rodents.

Human carcinogenicity data are considered inadequate. Two studies of workers exposed to aldrin and to dieldrin reported no increased incidence of cancer. Both studies were limited in their ability to detect an excess of cancer deaths.

Animal carcinogenicity data were sufficient. Dieldrin has been shown to be carcinogenic in various strains of mice of both sexes. At different dose levels the effects range from benign liver tumors, to hepatocarcinomas with transplantation confirmation, to pulmonary metastases.

Supporting data for carcinogenicity include genotoxicity tests. Dieldrin causes chromosomal aberrations in mouse cells (Markaryan, 1966; Majumdar et al., 1976) and in human lymphoblastoid cells (Trepanier et al., 1977), mutation in Chinese hamster cells (Ahmed et al., 1977), and unscheduled DNA synthesis in rat (Probst et al., 1981) and human cells (Rocchi et al., 1980).

EPA (1998) reports an Oral Slope Factor of $1.6E+1$ per (mg/kg)/day based on a diet study in mice which produced liver carcinomas.

This inhalation cancer slope factor of 16 per mg/kg/day was calculated from the oral slope factor.

D.4.12 INDENO(1,2,3-CD)PYRENE

D.4.12.1 Noncancer Toxicity

The chronic oral RfD and chronic inhalation RfC are not available.

D.4.12.2 Carcinogenicity

EPA classifies indeno(1,2,3-cd)pyrene as cancer weight-of-evidence B2, probable human carcinogen, based on sufficient data from animal bioassays. Indeno(1,2,3-cd)pyrene produced tumors in mice following lung implants, subcutaneous injection and dermal exposure. Indeno(1,2,3-cd)pyrene tested positive in bacterial gene mutation assays.

Although there are no human data that specifically link exposure to indeno(1,2,3-cd)pyrene to human cancers, indeno(1,2,3-cd)pyrene is a component of mixtures that have been associated with human cancer. These include coal tar, soot, coke oven emissions and cigarette smoke (EPA, 1984, 1990; IARC, 1984).

In animal carcinogen bioassays indeno(1,2,3-cd)pyrene exposure resulted in increased incidences of epidermoid carcinomas in a lung implantation study (Deutsch-Wenzel et al., 1983), injection site sarcomas in a subcutaneous injection assay (Lacassagne et al., 1963) and skin tumors in dermal application studies (Hoffman and Wynder, 1966; Rice et al., 1985a, 1986).

Supporting data for carcinogenicity includes genotoxicity studies. Indeno(1,2,3-cd)pyrene produced positive results in mutation assays in Salmonella typhimurium strains (LaVoie et al., 1979; Hermann et al., 1980; Rice et al., 1985b).

The currently used Oral Slope Factor (CSF) for indeno(1,2,3-cd)pyrene is 7.3E-01 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.1×7.3 (BaP) = 7.3E-01 per (mg/kg)/day (USEPA Region III Risk-Based Concentration Table, 4/1/98).

An inhalation cancer slope factor is not available.

D.4.13 IRON

D.4.13.1 Noncancer Toxicity

Iron is potentially toxic in all forms and by all routes of exposure. Inorganic iron is a poison by the intraperitoneal route. The inhalation of large amounts of iron dust may result in iron pneumoconiosis or arc welders lung. Chronic exposure to excess levels of iron (>50-100 mg Iron/day) can result in pathological deposition of iron in tissues. The target organs are the pancreas and liver (Sax and Lewis, 1989).

Iron compounds are of varying toxicity. Iron oxides are a potential risk in all industrial settings. In general, ferrous compounds are more toxic than ferric compounds. Acute exposure to excessive levels of ferrous compounds can cause liver and kidney damage, altered respiratory rates, and convulsions (Sax and Lewis, 1989). An oral RfD of 0.3 mg/kg/day has been published for iron by the USEPA (1998). No inhalation RfD has been found for iron.

D.4.13.2 Carcinogenicity

Some iron compounds are suspected human carcinogens. Iron dust is an environmental neoplastigen, and an increased incidence of lung cancer has been associated with exposure to iron dust. Iron oxide is an experimental tumorigen and a suspected human carcinogen (Sax and Lewis, 1989). USEPA has not published oral or inhalation slope factors for iron.

D.4.14 MANGANESE

D.4.14.1 Noncancer Toxicity

Manganese is nutritionally required in humans for normal growth and health (EPA 1994). Humans exposed to approximately 0.8 mg manganese/kg/day in drinking water exhibited lethargy, mental disturbances (1/16 committed suicide), and other neurologic effects. The elderly appeared to be more sensitive than children. Oral treatment of laboratory rodents induced biochemical changes in the brain, but rodents did not exhibit the neurological signs exhibited by humans. Occupational exposure to high concentrations in air induced a generally typical spectrum of neurological effects, and increased incidence of pneumonia (ACGIH 1986).

A chronic oral RfD of 0.02 mg/kg-day has been made available for manganese for the ingestion of nonfoods (EPA Region III, 1998). Also, a chronic oral RfD of 0.14 mg/kg-day has recently been made available for the ingestion of manganese in food (EPA Region III, 1998). The EPA (1997) presented a verified chronic inhalation RfC of 0.00005 mg/m³ based on an LOAEL of 0.15 mg/m³ for respiratory symptoms and psychomotor disturbances in occupationally exposed humans and an uncertainty factor of 1000. The EPA (1992b) presented the same value as a subchronic inhalation RfC. The inhalation RfC is equivalent to 0.0000143 mg/kg/day, assuming humans inhale 20 m³ of air/day and weigh 70 kg. The CNS and respiratory tract are target organs of inhalation exposure to manganese.

D.4.14.2 Carcinogenicity

The EPA (1997) classifies manganese in cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans). Quantitative cancer risk estimates are not derived for Group D chemicals.

Existing studies are inadequate to assess the carcinogenicity of manganese.

D.4.15 POLYCHLORINATED BIPHENYLS (AROCOR -1260)

Aroclor® 1260 is a polychlorinated biphenyl (PCB) mixture containing approximately 38% $C_{12}H_4Cl_6$, 41% $C_{12}H_3Cl_7$, 8% $C_{12}H_2Cl_8$, and 12% $C_{12}H_5Cl_5$ with an average chlorine content of 60% (USAF 1989). PCBs are inert, thermally and physically stable, and have dielectric properties. In the environment, the behavior of PCB mixtures is directly correlated to the degree of chlorination. Aroclor® is strongly sorbed to soil and remains immobile when leached with water; however, the mixture is highly mobile in the presence of organic solvents (USAF 1989). PCBs are resistant to chemical degradation by oxidation or hydrolysis. However, biodegradation, especially of lower chlorinated PCBs, can occur (USAF 1989). PCBs have high bioconcentration factors and, due to lipophilicity, especially of highly chlorinated congeners, tend to accumulate in the fat of fish, birds, mammals, and humans (ATSDR 1995). The use of PCBs in the United States was limited to closed systems in 1974, and in February 1977, the U.S. Environmental Protection Agency (EPA) issued final regulations prohibiting PCB discharge into waterways (EPA 1977).

D.4.15.1 Pharmacokinetics

PCBs are absorbed after oral, inhalation, or dermal exposure and are stored in adipose tissue. The location of the chlorine atoms on the phenyl rings is an important factor in PCB metabolism and excretion. The major route of PCB excretion is in the urine and feces; however, of more importance is elimination in human milk. Metabolites are predominately found in urine and bile, while small amounts of parent compound are found in the feces. Biliary excretion appears to be the source of fecal excretion (ATSDR 1995).

D.4.15.2 Noncancer Toxicity

Accidental human poisonings and data from occupational exposure to PCBs suggest initial dermal and mucosal disturbances followed by systemic effects that may manifest themselves several years post-exposure. Initial effects are enlargement and hypersecretion of the Meibomian gland of the eye, swelling of the eyelids, pigmentation of the fingernails and mucous membranes, fatigue, and nausea. These effects were followed by hyperkeratosis, darkening of the skin, acneform eruptions, edema of the arms and legs, neurological symptoms, such as headache and limb numbness, and liver disturbance (USAF 1989).

Hepatotoxicity is a prominent effect of PCBs, including Aroclor® 1260, that has been well characterized (EPA 1996a). Effects include hepatic microsomal enzyme induction, increased serum levels of liver-related enzymes (indicative of hepatocellular damage), liver enlargement, lipid deposition, fibrosis, and

necrosis. Chloracne and immune function disorders have been observed in humans and several animal species after PCB exposure. Reproductive and developmental effects, including low-birth weight, and decreased gestational time, and decreased reproductive capacity, have been observed in human and animal species. No reference dose (RfD) or reference concentrations (RfC) have been verified for Aroclor® 1260.

Target organs for PCBs include the skin, liver, fetus, and neonate.

D.4.15.3 Carcinogenicity

Data are suggestive but not conclusive concerning the carcinogenicity of PCBs in humans. The EPA has not determined a weight-of-evidence classification or slope factor for Aroclor® 1260 specifically. However, hepatocellular carcinomas in three strains of rats and two strains of mice have led the EPA (1996b) to classify PCBs as group B2, probable human carcinogen. The carcinogenicity slope factor (q_1^*) for oral exposure to PCBs is $7.7 \text{ (mg/kg/day)}^{-1}$ based on an increase of hepatocellular tumors in female Sprague-Dawley rats treated with Aroclor® 1260. A drinking water unit risk of $2.2\text{E-}4 \text{ (g/L)}^{-1}$ for PCBs was calculated based on the q_1^* (EPA 1996b).

The EPA (1996a) has published an oral slope factor of $2.0 \text{ (mg/kg/day)}^{-1}$ for upper bound estimates for all PCBs (except Aroclor -1016) based on the linear extrapolation from LED10s (95% lower bounds on ED10, the estimated dose associated with 10% increased incidence of cancer). The EPA has also published a central-estimate slope factor of $1.0 \text{ (mg/kg/day)}^{-1}$ for PCBs, also derived from ED10s.

D.4.16 VANADIUM

D.4.16.1 Noncancer Toxicity

The oral toxicity of vanadium compounds to humans is very low (Lagerkvist et al. 1986), probably because little vanadium is absorbed from the GI tract. Effects in humans exposed by inhalation include upper and lower respiratory tract irritation. A provisional subchronic and chronic oral RfD of 0.007 mg/kg/day was derived from an NOEL of 5 ppm in rats in a lifetime drinking water study with vanadyl sulfate and an uncertainty factor of 100 (EPA 1997). A target organ could not be identified for oral exposure. The respiratory tract is the target organ for inhalation exposure.

D.4.16.2 Carcinogenicity

No information was located regarding the carcinogenicity of vanadium.

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APPENDIX D5
CARCINOGENIC HAZARD CALCULATIONS

TABLE D5-1A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	1.72E-09	mg/kg/day	1.60E-01	(mg/kg/day) ⁻¹	2.76E-08
	Aluminum	21500	mg/kg		mg/kg	M	8.41E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	2.15E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	3.23E-07
	Chromium	42.7	mg/kg		mg/kg	M	1.67E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	1.33E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	7.85E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	2.51E-08
	Aluminum	21500	mg/kg		mg/kg	M	3.84E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	3.14E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.15E-06
	Chromium	42.7	mg/kg		mg/kg	M	7.62E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	6.07E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.52E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 1B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	5.48E-11	mg/kg/day	1.61E+01	(mg/kg/day) ⁻¹	8.77E-10
	Aluminum	11161	mg/kg		mg/kg	M	4.37E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	9.16E-09	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	1.37E-08
	Chromium	12.8	mg/kg		mg/kg	M	5.01E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	7.44E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	5.00E-11	mg/kg/day	5.00E-05	(mg/kg/day) ⁻¹	1.60E-09
	Aluminum	11161	mg/kg		mg/kg	M	3.98E-06	mg/kg/day	1.00E+00	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	2.67E-08	mg/kg/day	3.00E-04	(mg/kg/day) ⁻¹	9.78E-08
	Chromium	12.8	mg/kg		mg/kg	M	4.57E-09	mg/kg/day	5.00E-03	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	6.78E-09	mg/kg/day	7.00E-03	(mg/kg/day) ⁻¹	NA
											1.14E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 2A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	2.21E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	3.54E-08
	Aluminum	21500	mg/kg		mg/kg	M	1.08E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	2.77E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	4.15E-07
	Chromium	42.7	mg/kg		mg/kg	M	2.15E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	1.71E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	1.27E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	4.07E-08
	Aluminum	21500	mg/kg		mg/kg	M	6.22E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	5.09E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.86E-06
	Chromium	42.7	mg/kg		mg/kg	M	1.24E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	9.84E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.36E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 2B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	1.23E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.97E-09
	Aluminum	11161	mg/kg		mg/kg	M	9.83E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	2.06E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	3.09E-08
	Chromium	12.8	mg/kg		mg/kg	M	1.13E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	1.67E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	2.47E-11	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	7.89E-10
	Aluminum	11161	mg/kg		mg/kg	M	1.97E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	1.32E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	4.83E-08
	Chromium	12.8	mg/kg		mg/kg	M	2.25E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	3.35E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											8.19E-08

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 3A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

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Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	7.69E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.23E-07
	Aluminum	21500	mg/kg		mg/kg	M	3.76E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	9.61E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	1.44E-06
	Chromium	42.7	mg/kg		mg/kg	M	7.46E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	5.94E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	3.54E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	1.13E-07
	Aluminum	21500	mg/kg		mg/kg	M	1.73E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	1.41E-06	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	5.18E-06
	Chromium	42.7	mg/kg		mg/kg	M	3.43E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	2.73E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											6.86E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 3B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	8.81E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.41E-08
	Aluminum	11161	mg/kg		mg/kg	M	7.02E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	1.47E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.21E-07
	Chromium	12.8	mg/kg		mg/kg	M	8.05E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	1.20E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	8.10E-11	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	2.59E-09
	Aluminum	11161	mg/kg		mg/kg	M	6.46E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	4.33E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.59E-07
	Chromium	12.8	mg/kg		mg/kg	M	7.41E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	1.10E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											3.96E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 4
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	2.31E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	3.69E-09
	Aluminum	21500	mg/kg		mg/kg	M	1.13E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	2.88E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	4.32E-08
	Chromium	42.7	mg/kg		mg/kg	M	2.24E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	1.78E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	6.37E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	2.04E-08
	Aluminum	21500	mg/kg		mg/kg	M	3.11E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	2.55E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	9.32E-07
	Chromium	42.7	mg/kg		mg/kg	M	6.18E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	4.92E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											9.99E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 5
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	3.54E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	5.67E-09
	Aluminum	21500	mg/kg		mg/kg	M	1.73E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	4.43E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	6.64E-08
	Chromium	42.7	mg/kg		mg/kg	M	3.44E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	2.74E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	4.24E-11	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	1.36E-09
	Aluminum	21500	mg/kg		mg/kg	M	2.07E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	1.70E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	6.21E-08
	Chromium	42.7	mg/kg		mg/kg	M	4.12E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	3.28E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.36E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 6A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	6.9E-08	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.10E-06
	Aluminum	21500	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	8.6E-06	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	1.29E-05
	Chromium	42.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	1.7E-08	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	5.30E-07
	Aluminum	21500	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	5.5	mg/kg		mg/kg	M	6.8E-06	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	2.48E-05
	Chromium	42.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	34	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											3.93E-05

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 6B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	2.3E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	3.70E-08
	Aluminum	11161	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	3.9E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	5.90E-07
	Chromium	12.8	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	3.0E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	9.50E-09
	Aluminum	11161	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.34	mg/kg		mg/kg	M	1.6E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	5.80E-07
	Chromium	12.8	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	19	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.22E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 7
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: Site 3
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	6.6	mg/kg		mg/kg	M	5.30E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	7.97E-08
Dermal	Arsenic	6.6	mg/kg		mg/kg	M	2.04E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	7.46E-08
											1.54E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 8A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	3.33E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	5.32E-08
	Aluminum	18920	mg/kg		mg/kg	M	7.41E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.49E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.23E-07
	Vanadium	26.9	mg/kg		mg/kg	M	1.05E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.52E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	4.85E-08
	Aluminum	18920	mg/kg		mg/kg	M	3.38E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	2.17E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	7.94E-07
	Vanadium	26.9	mg/kg		mg/kg	M	4.80E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.12E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 8B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	3.33E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	5.32E-09
	Aluminum	18920	mg/kg		mg/kg	M	7.41E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.49E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.23E-08
	Vanadium	26.9	mg/kg		mg/kg	M	1.05E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	3.03E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	9.71E-09
	Aluminum	18920	mg/kg		mg/kg	M	6.75E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	4.34E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.59E-07
	Vanadium	26.9	mg/kg		mg/kg	M	9.60E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.96E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 9A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	4.28E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	6.84E-08
	Aluminum	18920	mg/kg		mg/kg	M	9.52E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.91E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.87E-07
	Vanadium	26.9	mg/kg		mg/kg	M	1.35E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	2.46E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	7.87E-08
	Aluminum	18920	mg/kg		mg/kg	M	5.47E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	3.52E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.29E-06
	Vanadium	26.9	mg/kg		mg/kg	M	7.78E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.72E-06

- (1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 9B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	7.49E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.20E-08
	Aluminum	18920	mg/kg		mg/kg	M	1.67E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	3.35E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	5.02E-08
	Vanadium	26.9	mg/kg		mg/kg	M	2.37E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.50E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	4.79E-09
	Aluminum	18920	mg/kg		mg/kg	M	3.33E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	2.14E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	7.84E-08
	Vanadium	26.9	mg/kg		mg/kg	M	4.74E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.45E-07

- (1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.
(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

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TABLE D5 - 10A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.49E-08	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	2.38E-07
	Aluminum	18920	mg/kg		mg/kg	M	3.31E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	6.64E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	9.96E-07
	Vanadium	26.9	mg/kg		mg/kg	M	4.70E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	6.83E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	2.19E-07
	Aluminum	18920	mg/kg		mg/kg	M	1.52E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	9.77E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	3.58E-06
	Vanadium	26.9	mg/kg		mg/kg	M	2.16E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											5.03E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 10B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	5.35E-09	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	8.55E-08
	Aluminum	18920	mg/kg		mg/kg	M	1.19E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	2.39E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	3.59E-07
	Vanadium	26.9	mg/kg		mg/kg	M	1.69E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	4.92E-10	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	1.57E-08
	Aluminum	18920	mg/kg		mg/kg	M	1.09E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	7.04E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	2.58E-07
	Vanadium	26.9	mg/kg		mg/kg	M	1.56E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											7.17E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 11
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.60E+01	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.43E-08
	Aluminum	18920	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.50E+00	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	5.98E-08
	Vanadium	26.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.23E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	3.94E-08
	Aluminum	18920	mg/kg		mg/kg	M	2.74E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.76E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	6.44E-07
	Vanadium	26.9	mg/kg		mg/kg	M	3.89E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											7.57E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 12
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

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Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Construction Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	6.84E-10	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	1.09E-08
	Aluminum	18920	mg/kg		mg/kg	M	1.52E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	3.06E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	4.59E-08
	Vanadium	26.9	mg/kg		mg/kg	M	2.17E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	8.20E-11	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	2.62E-09
	Aluminum	18920	mg/kg		mg/kg	M	1.82E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	1.17E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	4.29E-08
	Vanadium	26.9	mg/kg		mg/kg	M	2.59E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.02E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 13A
SITE 4
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.3E-07	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	2.14E-06
	Aluminum	18920	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	5.9E-06	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	8.90E-06
	Vanadium	26.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	3.22E-08	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	1.03E-06
	Aluminum	18920	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	4.56E-06	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.67E-05
	Vanadium	26.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.88E-05

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 13B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.5E-08	mg/kg/day	1.60E+01	(mg/kg/day) ⁻¹	2.32E-07
	Aluminum	18920	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	6.4E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	9.60E-07
	Vanadium	26.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.81E-09	mg/kg/day	3.20E+01	(mg/kg/day) ⁻¹	5.80E-08
	Aluminum	18920	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.8	mg/kg		mg/kg	M	2.60E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	9.50E-07
	Vanadium	26.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.20E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 14
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil - (2 to 22 feet)
Exposure Point: Site 4
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.53E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.12E-08
	Benzo(a)pyrene	1.1	mg/kg		mg/kg	M	8.86E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	6.47E-08
	Benzo(b)fluoranthene	1.2	mg/kg		mg/kg	M	9.66E-09	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	7.05E-09
	Benzo(k)fluoranthene	0.59	mg/kg		mg/kg	M	4.75E-09	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	3.47E-10
	Chrysene	0.94	mg/kg		mg/kg	M	7.57E-09	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	5.52E-11
	Dibenzo(a,h)anthracene	0.23	mg/kg		mg/kg	M	1.85E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.35E-08
	Indeno(1,2,3-cd)pyrene	0.12	mg/kg		mg/kg	M	9.66E-10	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	7.05E-10
	Arsenic	6.4	mg/kg		mg/kg	M	5.15E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	7.73E-08
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.83E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.1	mg/kg		mg/kg	M	1.06E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	1.2	mg/kg		mg/kg	M	1.16E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	0.59	mg/kg		mg/kg	M	5.69E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	0.94	mg/kg		mg/kg	M	9.07E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
EPC - Exposure Point Concentrations mg/kg - milligram per kilogram mg/kg/day - milligram per kilogram per day	Dibenzo(a,h)anthracene	0.23	mg/kg		mg/kg	M	2.22E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	0.12	mg/kg		mg/kg	M	1.16E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	6.4	mg/kg		mg/kg	M	1.98E-08	mg/kg/day	3.66	(mg/kg/day) ⁻¹	7.23E-08
NA - not applicable											2.47E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE 5 - 15
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil (2 to 15')
Exposure Point: Site 4
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	6.4	mg/kg		mg/kg	M	5.15E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	7.73E-08
Dermal	Arsenic	6.4	mg/kg		mg/kg	M	1.98E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	7.23E-08
											1.50E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 16A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	7.44E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	5.43E-08
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	7.44E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	5.43E-07
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	8.22E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	6.00E-08
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	6.65E-08	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	4.86E-09
	Chrysene	2.1	mg/kg		mg/kg	M	8.22E-08	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	6.00E-10
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	7.83E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	5.71E-08
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	6.26E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	4.57E-08
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.35E-08	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	4.70E-08
	Aluminum	29100	mg/kg		mg/kg	M	1.14E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	1.37E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.05E-07
	Chromium	65	mg/kg		mg/kg	M	2.54E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Manganese	180	mg/kg		mg/kg	M	7.05E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	1.65E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	3.39E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	3.39E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	3.75E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	3.03E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	3.75E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	3.57E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.85E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.07E-08	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	2.38E-08
	Aluminum	29100	mg/kg		mg/kg	M	5.19E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	2.00E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	7.31E-07
	Chromium	65	mg/kg		mg/kg	M	1.16E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	7.53E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA

1.77E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 16B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	6.46E-09	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	4.71E-09
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	6.85E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	5.00E-08
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	8.02E-09	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	5.86E-09
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	6.26E-09	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	4.57E-10
	Chrysene	1.9	mg/kg		mg/kg	M	7.44E-09	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	5.43E-11
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	5.09E-10	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	3.71E-09
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	5.87E-09	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	4.29E-09
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.35E-09	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	4.70E-09
	Aluminum	17390	mg/kg		mg/kg	M	6.81E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	1.10E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	1.64E-08
	Chromium	40.725	mg/kg		mg/kg	M	1.59E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	1.41E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	5.89E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	6.24E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	7.32E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	5.71E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	1.9	mg/kg		mg/kg	M	6.78E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	4.64E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	5.35E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.14E-09	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	4.75E-09
	Aluminum	17390	mg/kg		mg/kg	M	6.21E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	3.20E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.17E-07
	Chromium	40.725	mg/kg		mg/kg	M	1.45E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	1.28E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA

2.12E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 17A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	9.56E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	6.98E-08
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	9.56E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	6.98E-07
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.06E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	7.71E-08
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	8.55E-08	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	6.24E-09
	Chrysene	2.1	mg/kg		mg/kg	M	1.06E-07	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	7.71E-10
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.01E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	7.35E-08
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	8.05E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	5.88E-08
	Aroclor-1260	0.6	mg/kg		mg/kg	M	3.02E-08	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	6.04E-08
	Aluminum	29100	mg/kg		mg/kg	M	1.46E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	1.76E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.64E-07
	Chromium	65	mg/kg		mg/kg	M	3.27E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	2.12E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	5.50E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	5.50E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	6.08E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	4.92E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	6.08E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	5.79E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	4.63E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.74E-08	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	3.85E-08
	Aluminum	29100	mg/kg		mg/kg	M	8.42E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	3.24E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.19E-06
	Chromium	65	mg/kg		mg/kg	M	1.88E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	1.22E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.53E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 17B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	1.45E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.06E-08
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	1.54E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.13E-07
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	1.81E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.32E-08
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	1.41E-08	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	1.03E-09
	Chrysene	1.9	mg/kg		mg/kg	M	1.67E-08	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	1.22E-10
	Dibenzo(a,h)anthracene	0.13	mg/kg		mg/kg	M	1.14E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	8.36E-09
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	1.32E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	9.64E-09
	Aroclor-1260	0.6	mg/kg		mg/kg	M	5.28E-09	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	1.06E-08
	Aluminum	17390	mg/kg		mg/kg	M	1.53E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	2.47E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	3.70E-08
	Chromium	40.7	mg/kg		mg/kg	M	3.58E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	3.17E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	2.91E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	3.08E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	3.61E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	2.82E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	1.9	mg/kg		mg/kg	M	3.35E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.13	mg/kg		mg/kg	M	2.29E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	2.64E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.06E-09	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	2.35E-09
	Aluminum	17390	mg/kg		mg/kg	M	3.06E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	1.58E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	5.78E-08
	Chromium	40.7	mg/kg		mg/kg	M	7.17E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	6.34E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.63E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 18A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	3.32E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.42E-07
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	3.32E-07	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.42E-06
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	3.67E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.68E-07
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.97E-07	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	2.17E-08
	Chrysene	2.1	mg/kg		mg/kg	M	3.67E-07	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	2.68E-09
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	3.49E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.55E-07
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.80E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.04E-07
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.05E-07	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	2.10E-07
	Aluminum	29100	mg/kg		mg/kg	M	5.08E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	6.12E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	9.17E-07
	Chromium	65	mg/kg		mg/kg	M	1.14E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	7.37E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.53E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.53E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.69E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.37E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	1.69E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.61E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.29E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	4.82E-08	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	1.07E-07
	Aluminum	29100	mg/kg		mg/kg	M	2.34E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	9.00E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	3.29E-06
	Chromium	65	mg/kg		mg/kg	M	5.22E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	3.39E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											7.95E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 18B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	1.04E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	7.58E-08
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	1.10E-07	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	8.04E-07
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	1.29E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	9.41E-08
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	1.01E-07	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	7.35E-09
	Chrysene	1.9	mg/kg		mg/kg	M	1.20E-07	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	8.72E-10
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	8.18E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	5.97E-08
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	9.44E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	6.89E-08
	Aroclor-1260	0.6	mg/kg		mg/kg	M	3.77E-08	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	7.55E-08
	Aluminum	17390	mg/kg		mg/kg	M	1.09E-03	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	1.76E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	2.64E-07
	Chromium	40.725	mg/kg		mg/kg	M	2.56E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	2.26E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	9.55E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	1.01E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	1.19E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	9.26E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	1.9	mg/kg		mg/kg	M	1.10E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	7.52E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	8.68E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	3.47E-09	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	7.71E-09
	Aluminum	17390	mg/kg		mg/kg	M	1.01E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	5.19E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.90E-07
	Chromium	40.725	mg/kg		mg/kg	M	2.36E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	2.08E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.65E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 19A
 CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
 SITE 6
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 6
 Receptor Population: Site Maintenance Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.99E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.45E-08
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.99E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.45E-07
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.20E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.61E-08
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.78E-08	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	1.30E-09
	Chrysene	2.1	mg/kg		mg/kg	M	2.20E-08	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	1.61E-10
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.10E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.53E-08
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.68E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.22E-08
	Aroclor-1260	0.6	mg/kg		mg/kg	M	6.29E-09	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	1.26E-08
	Aluminum	29100	mg/kg		mg/kg	M	3.05E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	3.67E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	5.50E-08
	Chromium	65	mg/kg		mg/kg	M	6.81E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	4.42E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.75E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.75E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	3.04E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.46E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	3.04E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.89E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.31E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	8.68E-09	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	1.93E-08
	Aluminum	29100	mg/kg		mg/kg	M	4.21E-05	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	1.62E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	5.93E-07
	Chromium	65	mg/kg		mg/kg	M	9.40E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	6.11E-08	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											8.85E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
 mg/kg - milligram per kilogram
 mg/kg/day - milligram per kilogram per day
 NA - not applicable

TABLE D5 - 20
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.53E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.12E-08
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.53E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.12E-07
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.69E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.23E-08
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.37E-08	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	9.99E-10
	Chrysene	2.1	mg/kg		mg/kg	M	1.69E-08	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	1.23E-10
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.61E-09	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	1.18E-08
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.29E-08	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	9.40E-09
	Aroclor-1260	0.6	mg/kg		mg/kg	M	4.83E-09	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	9.66E-09
	Aluminum	29100	mg/kg		mg/kg	M	2.34E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	2.82E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	4.23E-08
	Chromium	65	mg/kg		mg/kg	M	5.23E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	3.40E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.83E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.83E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.03E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.64E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	2.03E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.93E-10	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.54E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	5.79E-10	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	1.28E-09
	Aluminum	29100	mg/kg		mg/kg	M	2.81E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	1.08E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	3.95E-08
	Chromium	65	mg/kg		mg/kg	M	6.27E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	4.07E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.50E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 21A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.9E-06	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.15E-06
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.9E-06	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.15E-05
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	3.3E-06	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.42E-06
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.7E-06	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	1.98E-07
	Chrysene	2.1	mg/kg		mg/kg	M	3.3E-06	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	2.42E-08
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	3.1E-07	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.29E-06
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.5E-06	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	1.85E-06
	Aroclor-1260	0.6	mg/kg		mg/kg	M	9.3E-07	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	1.86E-06
	Aluminum	29100	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	5.5E-06	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	8.30E-06
	Chromium	65	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	2.1	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.25E-07	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	5.00E-07
	Aluminum	29100	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.5	mg/kg		mg/kg	M	4.18E-06	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	1.53E-05
	Chromium	65	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	42.2	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA

5.64E-05

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 21B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	3.2E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.30E-07
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	3.2E-07	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.30E-06
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	3.6E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.60E-07
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	2.9E-07	mg/kg/day	7.30E-02	(mg/kg/day) ⁻¹	2.10E-08
	Chrysene	1.9	mg/kg		mg/kg	M	3.6E-07	mg/kg/day	7.30E-03	(mg/kg/day) ⁻¹	2.60E-09
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	3.4E-08	mg/kg/day	7.30E+00	(mg/kg/day) ⁻¹	2.50E-07
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	2.7E-07	mg/kg/day	7.30E-01	(mg/kg/day) ⁻¹	2.00E-07
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.0E-07	mg/kg/day	2.00E+00	(mg/kg/day) ⁻¹	2.00E-07
	Aluminum	17390	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	5.9E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	8.80E-07
	Chromium	40.725	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Vanadium	36	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chrysene	1.9	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.26E-08	mg/kg/day	2.22E+00	(mg/kg/day) ⁻¹	2.80E-08
	Aluminum	17390	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	2.8	mg/kg		mg/kg	M	2.40E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	8.80E-07
	Chromium	40.725	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Vanadium	36	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											5.3E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations
mg/kg - milligram per kilogram
mg/kg/day - milligram per kilogram per day
NA - not applicable

TABLE D5 - 22
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil - Grass
Exposure Point: Site 30
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	41600	mg/kg		mg/kg	M	3.35E-04	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	4.8	mg/kg		mg/kg	M	3.86E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	5.80E-08
	Vanadium	63.7	mg/kg		mg/kg	M	5.13E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	30.7	mg/kg		mg/kg	M	2.50E-07	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Aluminum	41600	mg/kg		mg/kg	M	4.01E-06	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	4.8	mg/kg		mg/kg	M	1.48E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	5.42E-08
	Vanadium	63.7	mg/kg		mg/kg	M	6.14E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	30.7	mg/kg		mg/kg	M	2.96E-09	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											1.12E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 23A
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil - Grass
Exposure Point: Site 30
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	41600	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	4.8	mg/kg		mg/kg	M	7.5E-06	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	1.13E-05
	Vanadium	63.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	30.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Aluminum	41600	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	4.8	mg/kg		mg/kg	M	5.80E-06	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	2.12E-05
	Vanadium	63.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	30.7	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											3.25E-05

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 23B
CALCULATION OF CANCER HAZARDS - CENTRAL TENDENCY EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil - Grass Area
Exposure Point: Site 30
Receptor Population: Resident
Receptor Age: Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	23767	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.9	mg/kg		mg/kg	M	6.55E-07	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	9.82E-07
	Vanadium	46.3	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	21.4	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
Dermal	Aluminum	23767	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Arsenic	3.9	mg/kg		mg/kg	M	2.65E-07	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	9.70E-07
	Vanadium	46.3	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
	Chromium	21.4	mg/kg		mg/kg	M	NA	mg/kg/day	NA	(mg/kg/day) ⁻¹	NA
											2.0E-06

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 24
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: Site 30
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	5.9	mg/kg		mg/kg	M	4.75E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	7.13E-08
Dermal	Arsenic	5.9	mg/kg		mg/kg	M	1.82E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	6.66E-08
											1.38E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

TABLE D5 - 25
CALCULATION OF CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE
SITE 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: Site 33
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	7.3	mg/kg		mg/kg	M	5.88E-08	mg/kg/day	1.50E+00	(mg/kg/day) ⁻¹	8.82E-08
Dermal	Arsenic	7.3	mg/kg		mg/kg	M	2.25E-08	mg/kg/day	3.66E+00	(mg/kg/day) ⁻¹	8.25E-08
											1.71E-07

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

NA - not applicable

APPENDIX D6
NON-CARCINOGENIC HAZARD CALCULATIONS

TABLE D6-1A
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 3
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 3
 Receptor Population: Trespasser
 Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	1.2E-08	mg/kg/day	5.00E-05	mg/kg/day			2.4E-04
	Aluminum	21500	mg/kg		mg/kg	M	5.9E-03	mg/kg/day	1.00E+00	mg/kg/day			5.9E-03
	Arsenic	5.5	mg/kg		mg/kg	M	1.5E-06	mg/kg/day	3.00E-04	mg/kg/day			5.0E-03
	Chromium	42.7	mg/kg		mg/kg	M	1.2E-05	mg/kg/day	5.00E-03	mg/kg/day			2.3E-03
	Vanadium	34	mg/kg		mg/kg	M	9.3E-06	mg/kg/day	7.00E-03	mg/kg/day			1.3E-03
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	5.50E-09	mg/kg/day	2.50E-05	mg/kg/day			2.2E-04
	Aluminum	21500	mg/kg		mg/kg	M	2.69E-04	mg/kg/day	1.00E-01	mg/kg/day			2.7E-03
	Arsenic	5.5	mg/kg		mg/kg	M	2.20E-06	mg/kg/day	1.23E-04	mg/kg/day			1.8E-02
	Chromium	42.7	mg/kg		mg/kg	M	5.33E-07	mg/kg/day	1.00E-04	mg/kg/day			5.3E-03
	Vanadium	34	mg/kg		mg/kg	M	4.25E-07	mg/kg/day	7.00E-05	mg/kg/day			6.1E-03
Total Hazard Index Across All Exposure Routes/Pathways													4.7E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-1B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	1.9E-09	mg/kg/day	5.00E-05	mg/kg/day			3.8E-05
	Aluminum	11161	mg/kg		mg/kg	M	1.5E-03	mg/kg/day	1.00E+00	mg/kg/day			1.5E-03
	Arsenic	2.34	mg/kg		mg/kg	M	3.2E-07	mg/kg/day	3.00E-04	mg/kg/day			1.1E-03
	Chromium	12.8	mg/kg		mg/kg	M	1.8E-06	mg/kg/day	5.00E-03	mg/kg/day			3.5E-04
	Vanadium	19	mg/kg		mg/kg	M	2.6E-06	mg/kg/day	7.00E-03	mg/kg/day			3.7E-04
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	1.75E-09	mg/kg/day	2.50E-05	mg/kg/day			7.0E-05
	Aluminum	11161	mg/kg		mg/kg	M	1.39E-04	mg/kg/day	1.00E-01	mg/kg/day			1.4E-03
	Arsenic	2.34	mg/kg		mg/kg	M	9.35E-07	mg/kg/day	1.23E-04	mg/kg/day			7.6E-03
	Chromium	12.8	mg/kg		mg/kg	M	1.60E-07	mg/kg/day	1.00E-04	mg/kg/day			1.6E-03
	Vanadium	19	mg/kg		mg/kg	M	2.37E-07	mg/kg/day	7.00E-05	mg/kg/day			3.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													1.7E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-2A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	7.7E-09	mg/kg/day	5.00E-05	mg/kg/day			1.5E-04
	Aluminum	21500	mg/kg		mg/kg	M	3.8E-03	mg/kg/day	1.00E+00	mg/kg/day			3.8E-03
	Arsenic	5.5	mg/kg		mg/kg	M	9.7E-07	mg/kg/day	3.00E-04	mg/kg/day			3.2E-03
	Chromium	42.7	mg/kg		mg/kg	M	7.5E-06	mg/kg/day	5.00E-03	mg/kg/day			1.5E-03
	Vanadium	34	mg/kg		mg/kg	M	6.0E-06	mg/kg/day	7.00E-03	mg/kg/day			8.6E-04
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	4.46E-09	mg/kg/day	2.50E-05	mg/kg/day			1.8E-04
	Aluminum	21500	mg/kg		mg/kg	M	2.18E-04	mg/kg/day	1.00E-01	mg/kg/day			2.2E-03
	Arsenic	5.5	mg/kg		mg/kg	M	1.78E-06	mg/kg/day	1.23E-04	mg/kg/day			1.4E-02
	Chromium	42.7	mg/kg		mg/kg	M	4.32E-07	mg/kg/day	1.00E-04	mg/kg/day			4.3E-03
	Vanadium	34	mg/kg		mg/kg	M	3.44E-07	mg/kg/day	7.00E-05	mg/kg/day			4.9E-03
Total Hazard Index Across All Exposure Routes/Pathways													3.6E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-2B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	1.2E-09	mg/kg/day	5.00E-05	mg/kg/day			2.5E-05
	Aluminum	11161	mg/kg		mg/kg	M	9.8E-04	mg/kg/day	1.00E+00	mg/kg/day			9.8E-04
	Arsenic	2.34	mg/kg		mg/kg	M	2.1E-07	mg/kg/day	3.00E-04	mg/kg/day			6.9E-04
	Chromium	12.8	mg/kg		mg/kg	M	1.1E-06	mg/kg/day	5.00E-03	mg/kg/day			2.3E-04
	Vanadium	19	mg/kg		mg/kg	M	1.7E-06	mg/kg/day	7.00E-03	mg/kg/day			2.4E-04
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	2.47E-10	mg/kg/day	2.50E-05	mg/kg/day			9.9E-06
	Aluminum	11161	mg/kg		mg/kg	M	1.97E-05	mg/kg/day	1.00E-01	mg/kg/day			2.0E-04
	Arsenic	2.34	mg/kg		mg/kg	M	1.32E-07	mg/kg/day	1.23E-04	mg/kg/day			1.1E-03
	Chromium	12.8	mg/kg		mg/kg	M	2.25E-08	mg/kg/day	1.00E-04	mg/kg/day			2.3E-04
	Vanadium	19	mg/kg		mg/kg	M	3.35E-08	mg/kg/day	7.00E-05	mg/kg/day			4.8E-04
Total Hazard Index Across All Exposure Routes/Pathways													4.1E-03

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-3A
CALCULATION OF NON-CANCER HAZARDS
SITE 3

REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	2.2E-08	mg/kg/day	5.00E-05	mg/kg/day			4.3E-04
	Aluminum	21500	mg/kg		mg/kg	M	1.1E-02	mg/kg/day	1.00E+00	mg/kg/day			1.1E-02
	Arsenic	5.5	mg/kg		mg/kg	M	2.7E-06	mg/kg/day	3.00E-04	mg/kg/day			9.0E-03
	Chromium	42.7	mg/kg		mg/kg	M	2.1E-05	mg/kg/day	5.00E-03	mg/kg/day			4.2E-03
	Vanadium	34	mg/kg		mg/kg	M	1.7E-05	mg/kg/day	7.00E-03	mg/kg/day			2.4E-03
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	9.90E-09	mg/kg/day	2.50E-05	mg/kg/day			4.0E-04
	Aluminum	21500	mg/kg		mg/kg	M	4.84E-04	mg/kg/day	1.00E-01	mg/kg/day			4.8E-03
	Arsenic	5.5	mg/kg		mg/kg	M	3.96E-06	mg/kg/day	1.23E-04	mg/kg/day			3.2E-02
	Chromium	42.7	mg/kg		mg/kg	M	9.61E-07	mg/kg/day	1.00E-04	mg/kg/day			9.6E-03
	Vanadium	34	mg/kg		mg/kg	M	7.65E-07	mg/kg/day	7.00E-05	mg/kg/day			1.1E-02
Total Hazard Index Across All Exposure Routes/Pathways													8.4E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-3B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	6.8E-09	mg/kg/day	5.00E-05	mg/kg/day			1.4E-04
	Aluminum	11161	mg/kg		mg/kg	M	5.5E-03	mg/kg/day	1.00E+00	mg/kg/day			5.5E-03
	Arsenic	2.34	mg/kg		mg/kg	M	1.1E-06	mg/kg/day	3.00E-04	mg/kg/day			3.8E-03
	Chromium	12.8	mg/kg		mg/kg	M	6.3E-06	mg/kg/day	5.00E-03	mg/kg/day			1.3E-03
	Vanadium	19	mg/kg		mg/kg	M	9.3E-06	mg/kg/day	7.00E-03	mg/kg/day			1.3E-03
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	6.30E-10	mg/kg/day	2.50E-05	mg/kg/day			2.5E-05
	Aluminum	11161	mg/kg		mg/kg	M	5.02E-05	mg/kg/day	1.00E-01	mg/kg/day			5.0E-04
	Arsenic	2.34	mg/kg		mg/kg	M	3.37E-07	mg/kg/day	1.23E-04	mg/kg/day			2.7E-03
	Chromium	12.8	mg/kg		mg/kg	M	5.76E-08	mg/kg/day	1.00E-04	mg/kg/day			5.8E-04
	Vanadium	19	mg/kg		mg/kg	M	8.55E-08	mg/kg/day	7.00E-05	mg/kg/day			1.2E-03
Total Hazard Index Across All Exposure Routes/Pathways													1.7E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-4
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	6.5E-10	mg/kg/day	5.00E-05	mg/kg/day			1.3E-05
	Aluminum	21500	mg/kg		mg/kg	M	3.2E-04	mg/kg/day	1.00E+00	mg/kg/day			3.2E-04
	Arsenic	5.5	mg/kg		mg/kg	M	8.1E-08	mg/kg/day	3.00E-04	mg/kg/day			2.7E-04
	Chromium	42.7	mg/kg		mg/kg	M	6.3E-07	mg/kg/day	5.00E-03	mg/kg/day			1.3E-04
	Vanadium	34	mg/kg		mg/kg	M	5.0E-07	mg/kg/day	7.00E-03	mg/kg/day			7.1E-05
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	1.78E-09	mg/kg/day	2.50E-05	mg/kg/day			7.1E-05
	Aluminum	21500	mg/kg		mg/kg	M	8.71E-05	mg/kg/day	1.00E-01	mg/kg/day			8.7E-04
	Arsenic	5.5	mg/kg		mg/kg	M	7.13E-07	mg/kg/day	1.23E-04	mg/kg/day			5.8E-03
	Chromium	42.7	mg/kg		mg/kg	M	1.73E-07	mg/kg/day	1.00E-04	mg/kg/day			1.7E-03
	Vanadium	34	mg/kg		mg/kg	M	1.38E-07	mg/kg/day	7.00E-05	mg/kg/day			2.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													1.1E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-5
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	2.5E-08	mg/kg/day	5.00E-05	mg/kg/day			5.0E-04
	Aluminum	21500	mg/kg		mg/kg	M	1.2E-02	mg/kg/day	1.00E+00	mg/kg/day			1.2E-02
	Arsenic	5.5	mg/kg		mg/kg	M	3.1E-06	mg/kg/day	3.00E-04	mg/kg/day			1.0E-02
	Chromium	42.7	mg/kg		mg/kg	M	2.4E-05	mg/kg/day	5.00E-03	mg/kg/day			4.8E-03
	Vanadium	34	mg/kg		mg/kg	M	1.9E-05	mg/kg/day	7.00E-03	mg/kg/day			2.7E-03
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	2.97E-09	mg/kg/day	2.50E-05	mg/kg/day			1.2E-04
	Aluminum	21500	mg/kg		mg/kg	M	1.45E-04	mg/kg/day	1.00E-01	mg/kg/day			1.5E-03
	Arsenic	5.5	mg/kg		mg/kg	M	1.19E-06	mg/kg/day	1.23E-04	mg/kg/day			9.7E-03
	Chromium	42.7	mg/kg		mg/kg	M	2.88E-07	mg/kg/day	1.00E-04	mg/kg/day			2.9E-03
	Vanadium	34	mg/kg		mg/kg	M	2.30E-07	mg/kg/day	7.00E-05	mg/kg/day			3.3E-03
Total Hazard Index Across All Exposure Routes/Pathways													4.8E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-6A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	6.0E-08	mg/kg/day	5.00E-05	mg/kg/day			1.2E-03
	Aluminum	21500	mg/kg		mg/kg	M	2.9E-02	mg/kg/day	1.00E+00	mg/kg/day			2.9E-02
	Arsenic	5.5	mg/kg		mg/kg	M	7.5E-06	mg/kg/day	3.00E-04	mg/kg/day			2.5E-02
	Chromium	42.7	mg/kg		mg/kg	M	5.8E-05	mg/kg/day	5.00E-03	mg/kg/day			1.2E-02
	Vanadium	34	mg/kg		mg/kg	M	4.7E-05	mg/kg/day	7.00E-03	mg/kg/day			6.7E-03
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	3.50E-08	mg/kg/day	2.50E-05	mg/kg/day			1.4E-03
	Aluminum	21500	mg/kg		mg/kg	M	1.71E-03	mg/kg/day	1.00E-01	mg/kg/day			1.7E-02
	Arsenic	5.5	mg/kg		mg/kg	M	1.40E-05	mg/kg/day	1.23E-04	mg/kg/day			1.1E-01
	Chromium	42.7	mg/kg		mg/kg	M	3.39E-06	mg/kg/day	1.00E-04	mg/kg/day			3.4E-02
	Vanadium	34	mg/kg		mg/kg	M	2.70E-06	mg/kg/day	7.00E-05	mg/kg/day			3.9E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.8E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-6B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 3
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 3
 Receptor Population: Resident
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	6.4E-09	mg/kg/day	5.00E-05	mg/kg/day			1.3E-04
	Aluminum	11161	mg/kg		mg/kg	M	5.1E-03	mg/kg/day	1.00E+00	mg/kg/day			5.1E-03
	Arsenic	2.34	mg/kg		mg/kg	M	1.1E-06	mg/kg/day	3.00E-04	mg/kg/day			3.6E-03
	Chromium	12.8	mg/kg		mg/kg	M	5.9E-06	mg/kg/day	5.00E-03	mg/kg/day			1.2E-03
	Vanadium	19	mg/kg		mg/kg	M	8.7E-06	mg/kg/day	7.00E-03	mg/kg/day			1.2E-03
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	1.28E-09	mg/kg/day	2.50E-05	mg/kg/day			1.0E-04
	Aluminum	11161	mg/kg		mg/kg	M	1.02E-04	mg/kg/day	1.00E-01	mg/kg/day			1.0E-03
	Arsenic	2.34	mg/kg		mg/kg	M	6.86E-07	mg/kg/day	1.23E-04	mg/kg/day			5.6E-03
	Chromium	12.8	mg/kg		mg/kg	M	1.17E-07	mg/kg/day	1.00E-04	mg/kg/day			1.2E-03
	Vanadium	19	mg/kg		mg/kg	M	1.74E-07	mg/kg/day	7.00E-05	mg/kg/day			2.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.2E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-7A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 3
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.044	mg/kg		mg/kg	M	5.6E-07	mg/kg/day	5.00E-05	mg/kg/day			1.1E-02
	Aluminum	21500	mg/kg		mg/kg	M	2.7E-01	mg/kg/day	1.00E+00	mg/kg/day			2.7E-01
	Arsenic	5.5	mg/kg		mg/kg	M	7.0E-05	mg/kg/day	3.00E-04	mg/kg/day			2.3E-01
	Chromium	42.7	mg/kg		mg/kg	M	5.5E-04	mg/kg/day	5.00E-03	mg/kg/day			1.1E-01
	Vanadium	34	mg/kg		mg/kg	M	4.3E-04	mg/kg/day	7.00E-03	mg/kg/day			6.2E-02
Dermal	Dieldrin	0.044	mg/kg		mg/kg	M	5.39E-08	mg/kg/day	2.50E-05	mg/kg/day			2.2E-03
	Aluminum	21500	mg/kg		mg/kg	M	2.63E-03	mg/kg/day	1.00E-01	mg/kg/day			2.6E-02
	Arsenic	5.5	mg/kg		mg/kg	M	2.15E-05	mg/kg/day	1.23E-04	mg/kg/day			1.8E-01
	Chromium	42.7	mg/kg		mg/kg	M	5.23E-06	mg/kg/day	1.00E-04	mg/kg/day			5.2E-02
	Vanadium	34	mg/kg		mg/kg	M	4.16E-06	mg/kg/day	7.00E-05	mg/kg/day			5.9E-02
Total Hazard Index Across All Exposure Routes/Pathways													1.0E+00

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

3

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-7B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 3
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 3
 Receptor Population: Resident
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.014	mg/kg		mg/kg	M	6.0E-08	mg/kg/day	5.00E-05	mg/kg/day			1.2E-03
	Aluminum	11161	mg/kg		mg/kg	M	4.8E-02	mg/kg/day	1.00E+00	mg/kg/day			4.8E-02
	Arsenic	2.34	mg/kg		mg/kg	M	1.0E-05	mg/kg/day	3.00E-04	mg/kg/day			3.3E-02
	Chromium	12.8	mg/kg		mg/kg	M	5.5E-05	mg/kg/day	5.00E-03	mg/kg/day			1.1E-02
	Vanadium	19	mg/kg		mg/kg	M	8.1E-05	mg/kg/day	7.00E-03	mg/kg/day			1.2E-02
Dermal	Dieldrin	0.014	mg/kg		mg/kg	M	5.95E-09	mg/kg/day	2.50E-05	mg/kg/day			2.4E-04
	Aluminum	11161	mg/kg		mg/kg	M	4.74E-04	mg/kg/day	1.00E-01	mg/kg/day			4.7E-03
	Arsenic	2.34	mg/kg		mg/kg	M	3.18E-06	mg/kg/day	1.23E-04	mg/kg/day			2.6E-02
	Chromium	12.8	mg/kg		mg/kg	M	5.44E-07	mg/kg/day	1.00E-04	mg/kg/day			5.4E-03
	Vanadium	19	mg/kg		mg/kg	M	8.08E-07	mg/kg/day	7.00E-05	mg/kg/day			1.2E-02
Total Hazard Index Across All Exposure Routes/Pathways													1.5E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-8
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: Site 3
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	6.6	mg/kg		mg/kg	M	3.7E-06	mg/kg/day	5.00E-05	mg/kg/day			1.2E-02
Dermal	Arsenic	6.6	mg/kg		mg/kg	M	1.43E-06	mg/kg/day	2.50E-05	mg/kg/day			1.2E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.4E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-9A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	2.3E-08	mg/kg/day	5.00E-05	mg/kg/day			4.7E-04
	Aluminum	18920	mg/kg		mg/kg	M	5.2E-03	mg/kg/day	1.00E+00	mg/kg/day			5.2E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.0E-06	mg/kg/day	3.00E-04	mg/kg/day			3.5E-03
	Vanadium	26.9	mg/kg		mg/kg	M	7.4E-06	mg/kg/day	7.00E-03	mg/kg/day			1.1E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.06E-08	mg/kg/day	2.50E-05	mg/kg/day			4.2E-04
	Aluminum	18920	mg/kg		mg/kg	M	2.36E-04	mg/kg/day	1.00E-01	mg/kg/day			2.4E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.52E-06	mg/kg/day	1.23E-04	mg/kg/day			1.2E-02
	Vanadium	26.9	mg/kg		mg/kg	M	3.36E-07	mg/kg/day	7.00E-05	mg/kg/day			4.8E-03
Total Hazard Index Across All Exposure Routes/Pathways													3.0E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-9B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Trespasser
 Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.2E-08	mg/kg/day	5.00E-05	mg/kg/day			2.3E-04
	Aluminum	18920	mg/kg		mg/kg	M	2.6E-03	mg/kg/day	1.00E+00	mg/kg/day			2.6E-03
	Arsenic	3.8	mg/kg		mg/kg	M	5.2E-07	mg/kg/day	3.00E-04	mg/kg/day			1.7E-03
	Vanadium	26.9	mg/kg		mg/kg	M	3.7E-06	mg/kg/day	7.00E-03	mg/kg/day			5.3E-04
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.06E-08	mg/kg/day	2.50E-05	mg/kg/day			4.2E-04
	Aluminum	18920	mg/kg		mg/kg	M	2.36E-04	mg/kg/day	1.00E-01	mg/kg/day			2.4E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.52E-06	mg/kg/day	1.23E-04	mg/kg/day			1.2E-02
	Vanadium	26.9	mg/kg		mg/kg	M	3.36E-07	mg/kg/day	7.00E-05	mg/kg/day			4.8E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.5E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-10A
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Trespasser
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.5E-08	mg/kg/day	5.00E-05	mg/kg/day			3.0E-04
	Aluminum	18920	mg/kg		mg/kg	M	3.3E-03	mg/kg/day	1.00E+00	mg/kg/day			3.3E-03
	Arsenic	3.8	mg/kg		mg/kg	M	6.7E-07	mg/kg/day	3.00E-04	mg/kg/day			2.2E-03
	Vanadium	26.9	mg/kg		mg/kg	M	4.7E-06	mg/kg/day	7.00E-03	mg/kg/day			6.8E-04
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	8.61E-09	mg/kg/day	2.50E-05	mg/kg/day			3.4E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.92E-04	mg/kg/day	1.00E-01	mg/kg/day			1.9E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.23E-06	mg/kg/day	1.23E-04	mg/kg/day			1.0E-02
	Vanadium	26.9	mg/kg		mg/kg	M	2.72E-07	mg/kg/day	7.00E-05	mg/kg/day			3.9E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.3E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-10B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	7.5E-09	mg/kg/day	5.00E-05	mg/kg/day			1.5E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.7E-03	mg/kg/day	1.00E+00	mg/kg/day			1.7E-03
	Arsenic	3.8	mg/kg		mg/kg	M	3.3E-07	mg/kg/day	3.00E-04	mg/kg/day			1.1E-03
	Vanadium	26.9	mg/kg		mg/kg	M	2.4E-06	mg/kg/day	7.00E-03	mg/kg/day			3.4E-04
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.50E-09	mg/kg/day	2.50E-05	mg/kg/day			6.0E-05
	Aluminum	18920	mg/kg		mg/kg	M	3.33E-05	mg/kg/day	1.00E-01	mg/kg/day			3.3E-04
	Arsenic	3.8	mg/kg		mg/kg	M	2.14E-07	mg/kg/day	1.23E-04	mg/kg/day			1.7E-03
	Vanadium	26.9	mg/kg		mg/kg	M	4.74E-08	mg/kg/day	7.00E-05	mg/kg/day			6.8E-04
Total Hazard Index Across All Exposure Routes/Pathways													6.1E-03

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-11A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	4.2E-08	mg/kg/day	5.00E-05	mg/kg/day			8.3E-04
	Aluminum	18920	mg/kg		mg/kg	M	9.3E-03	mg/kg/day	1.00E+00	mg/kg/day			9.3E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.9E-06	mg/kg/day	3.00E-04	mg/kg/day			6.2E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.3E-05	mg/kg/day	7.00E-03	mg/kg/day			1.9E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.91E-08	mg/kg/day	2.50E-05	mg/kg/day			7.7E-04
	Aluminum	18920	mg/kg		mg/kg	M	4.26E-04	mg/kg/day	1.00E-01	mg/kg/day			4.3E-03
	Arsenic	3.8	mg/kg		mg/kg	M	2.74E-06	mg/kg/day	1.23E-04	mg/kg/day			2.2E-02
	Vanadium	26.9	mg/kg		mg/kg	M	6.05E-07	mg/kg/day	7.00E-05	mg/kg/day			8.6E-03
Total Hazard Index Across All Exposure Routes/Pathways													5.4E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-11B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	4.2E-08	mg/kg/day	5.00E-05	mg/kg/day			8.3E-04
	Aluminum	18920	mg/kg		mg/kg	M	9.3E-03	mg/kg/day	1.00E+00	mg/kg/day			9.3E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.9E-06	mg/kg/day	3.00E-04	mg/kg/day			6.2E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.3E-05	mg/kg/day	7.00E-03	mg/kg/day			1.9E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	3.83E-09	mg/kg/day	2.50E-05	mg/kg/day			1.5E-04
	Aluminum	18920	mg/kg		mg/kg	M	8.52E-05	mg/kg/day	1.00E-01	mg/kg/day			8.5E-04
	Arsenic	3.8	mg/kg		mg/kg	M	5.47E-07	mg/kg/day	1.23E-04	mg/kg/day			4.4E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.21E-07	mg/kg/day	7.00E-05	mg/kg/day			1.7E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.5E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-12A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	2.5E-09	mg/kg/day	5.00E-05	mg/kg/day			5.0E-05
	Aluminum	18920	mg/kg		mg/kg	M	5.6E-04	mg/kg/day	1.00E+00	mg/kg/day			5.6E-04
	Arsenic	3.8	mg/kg		mg/kg	M	1.1E-07	mg/kg/day	3.00E-04	mg/kg/day			3.7E-04
	Vanadium	26.9	mg/kg		mg/kg	M	7.9E-07	mg/kg/day	7.00E-03	mg/kg/day			1.1E-04
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	3.44E-09	mg/kg/day	2.50E-05	mg/kg/day			1.4E-04
	Aluminum	18920	mg/kg		mg/kg	M	7.66E-05	mg/kg/day	1.00E-01	mg/kg/day			7.7E-04
	Arsenic	3.8	mg/kg		mg/kg	M	4.93E-07	mg/kg/day	1.23E-04	mg/kg/day			4.0E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.09E-07	mg/kg/day	7.00E-05	mg/kg/day			1.6E-03
Total Hazard Index Across All Exposure Routes/Pathways													7.6E-03

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-12B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Site Maintenance Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	5.0E-09	mg/kg/day	5.00E-05	mg/kg/day			1.0E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.1E-03	mg/kg/day	1.00E+00	mg/kg/day			1.1E-03
	Arsenic	3.8	mg/kg		mg/kg	M	2.2E-07	mg/kg/day	3.00E-04	mg/kg/day			7.4E-04
	Vanadium	26.9	mg/kg		mg/kg	M	1.6E-06	mg/kg/day	7.00E-03	mg/kg/day			2.3E-04
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	9.98E-10	mg/kg/day	2.50E-05	mg/kg/day			4.0E-05
	Aluminum	18920	mg/kg		mg/kg	M	2.22E-05	mg/kg/day	1.00E-01	mg/kg/day			2.2E-04
	Arsenic	3.8	mg/kg		mg/kg	M	1.43E-07	mg/kg/day	1.23E-04	mg/kg/day			1.2E-03
	Vanadium	26.9	mg/kg		mg/kg	M	3.16E-08	mg/kg/day	7.00E-05	mg/kg/day			4.5E-04
Total Hazard Index Across All Exposure Routes/Pathways													4.1E-03

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-13
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Construction Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	4.8E-08	mg/kg/day	5.00E-05	mg/kg/day			9.6E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.1E-02	mg/kg/day	1.00E+00	mg/kg/day			1.1E-02
	Arsenic	3.8	mg/kg		mg/kg	M	2.1E-06	mg/kg/day	3.00E-04	mg/kg/day			7.1E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.5E-05	mg/kg/day	7.00E-03	mg/kg/day			2.2E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	5.74E-09	mg/kg/day	2.50E-05	mg/kg/day			2.3E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.28E-04	mg/kg/day	1.00E-01	mg/kg/day			1.3E-03
	Arsenic	3.8	mg/kg		mg/kg	M	8.21E-07	mg/kg/day	1.23E-04	mg/kg/day			6.7E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.82E-07	mg/kg/day	7.00E-05	mg/kg/day			2.6E-03
Total Hazard Index Across All Exposure Routes/Pathways													3.2E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-14A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.2E-07	mg/kg/day	5.00E-05	mg/kg/day			2.3E-03
	Aluminum	18920	mg/kg		mg/kg	M	2.6E-02	mg/kg/day	1.00E+00	mg/kg/day			2.6E-02
	Arsenic	3.8	mg/kg		mg/kg	M	5.2E-06	mg/kg/day	3.00E-04	mg/kg/day			1.7E-02
	Vanadium	26.9	mg/kg		mg/kg	M	3.7E-05	mg/kg/day	7.00E-03	mg/kg/day			5.3E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	6.75E-08	mg/kg/day	2.50E-05	mg/kg/day			2.7E-03
	Aluminum	18920	mg/kg		mg/kg	M	1.50E-03	mg/kg/day	1.00E-01	mg/kg/day			1.5E-02
	Arsenic	3.8	mg/kg		mg/kg	M	9.66E-06	mg/kg/day	1.23E-04	mg/kg/day			7.9E-02
	Vanadium	26.9	mg/kg		mg/kg	M	2.14E-06	mg/kg/day	7.00E-05	mg/kg/day			3.1E-02
Total Hazard Index Across All Exposure Routes/Pathways													1.8E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-14B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Resident
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	3.9E-08	mg/kg/day	5.00E-05	mg/kg/day			7.8E-04
	Aluminum	18920	mg/kg		mg/kg	M	8.7E-03	mg/kg/day	1.00E+00	mg/kg/day			8.7E-03
	Arsenic	3.8	mg/kg		mg/kg	M	1.7E-06	mg/kg/day	3.00E-04	mg/kg/day			5.8E-03
	Vanadium	26.9	mg/kg		mg/kg	M	1.2E-05	mg/kg/day	7.00E-03	mg/kg/day			1.8E-03
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	6.75E-08	mg/kg/day	7.78E-09	mg/kg/day			3.1E-04
	Aluminum	18920	mg/kg		mg/kg	M	1.50E-03	mg/kg/day	1.73E-04	mg/kg/day			1.7E-03
	Arsenic	3.8	mg/kg		mg/kg	M	9.66E-06	mg/kg/day	1.11E-06	mg/kg/day			9.1E-03
	Vanadium	26.9	mg/kg		mg/kg	M	2.14E-06	mg/kg/day	2.46E-07	mg/kg/day			3.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													3.2E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-15A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 4
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	1.1E-06	mg/kg/day	5.00E-05	mg/kg/day			2.2E-02
	Aluminum	18920	mg/kg		mg/kg	M	2.4E-01	mg/kg/day	1.00E+00	mg/kg/day			2.4E-01
	Arsenic	3.8	mg/kg		mg/kg	M	4.9E-05	mg/kg/day	3.00E-04	mg/kg/day			1.6E-01
	Vanadium	26.9	mg/kg		mg/kg	M	3.4E-04	mg/kg/day	7.00E-03	mg/kg/day			4.9E-02
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	1.04E-07	mg/kg/day	2.50E-05	mg/kg/day			4.2E-03
	Aluminum	18920	mg/kg		mg/kg	M	2.32E-03	mg/kg/day	1.00E-01	mg/kg/day			2.3E-02
	Arsenic	3.8	mg/kg		mg/kg	M	1.49E-05	mg/kg/day	1.23E-04	mg/kg/day			1.2E-01
	Vanadium	26.9	mg/kg		mg/kg	M	3.29E-06	mg/kg/day	7.00E-05	mg/kg/day			4.7E-02
Total Hazard Index Across All Exposure Routes/Pathways													6.7E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-15B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil
 Exposure Point: Site 4
 Receptor Population: Resident
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	0.085	mg/kg		mg/kg	M	3.6E-07	mg/kg/day	5.00E-05	mg/kg/day			7.3E-03
	Aluminum	18920	mg/kg		mg/kg	M	8.1E-02	mg/kg/day	1.00E+00	mg/kg/day			8.1E-02
	Arsenic	3.8	mg/kg		mg/kg	M	1.6E-05	mg/kg/day	3.00E-04	mg/kg/day			5.4E-02
	Vanadium	26.9	mg/kg		mg/kg	M	1.1E-04	mg/kg/day	7.00E-03	mg/kg/day			1.6E-02
Dermal	Dieldrin	0.085	mg/kg		mg/kg	M	3.61E-08	mg/kg/day	2.50E-05	mg/kg/day			1.4E-03
	Aluminum	18920	mg/kg		mg/kg	M	8.04E-04	mg/kg/day	1.00E-01	mg/kg/day			8.0E-03
	Arsenic	3.8	mg/kg		mg/kg	M	5.17E-06	mg/kg/day	1.23E-04	mg/kg/day			4.2E-02
	Vanadium	26.9	mg/kg		mg/kg	M	1.14E-06	mg/kg/day	7.00E-05	mg/kg/day			1.6E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.3E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-16
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil - (2 to 22 feet)
Exposure Point: Site 4
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.1E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.1	mg/kg		mg/kg	M	6.2E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	1.2	mg/kg		mg/kg	M	6.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	0.59	mg/kg		mg/kg	M	3.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	0.94	mg/kg		mg/kg	M	5.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.23	mg/kg		mg/kg	M	1.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	0.12	mg/kg		mg/kg	M	6.8E-08	mg/kg/day	NA	mg/kg/day			NA
	Arsenic	6.4	mg/kg		mg/kg	M	3.6E-06	mg/kg/day	3.00E-04	mg/kg/day			1.2E-02
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.1	mg/kg		mg/kg	M	7.4E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	1.2	mg/kg		mg/kg	M	8.1E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	0.59	mg/kg		mg/kg	M	4.0E-08	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	0.94	mg/kg		mg/kg	M	6.3E-08	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.23	mg/kg		mg/kg	M	1.6E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	0.12	mg/kg		mg/kg	M	8.1E-09	mg/kg/day	NA	mg/kg/day			NA
	Arsenic	6.4	mg/kg		mg/kg	M	1.4E-06	mg/kg/day	1.23E-04	mg/kg/day			1.1E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.3E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-17
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Subsurface Soil - (2 to 15')
 Exposure Point: Site 4
 Receptor Population: Construction Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	6.4	mg/kg		mg/kg	M	3.6E-06	mg/kg/day	3.00E-04	mg/kg/day			1.2E-02
Dermal	Arsenic	6.4	mg/kg		mg/kg	M	1.38E-06	mg/kg/day	1.23E-04	mg/kg/day			1.1E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.3E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-18A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	5.2E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	5.2E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	5.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	4.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	5.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	5.5E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	4.4E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.6E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	8.0E-03	mg/kg/day	1.00E+00	mg/kg/day			8.0E-03
	Arsenic	3.5	mg/kg		mg/kg	M	9.6E-07	mg/kg/day	3.00E-04	mg/kg/day			3.2E-03
	Chromium	65	mg/kg		mg/kg	M	1.8E-05	mg/kg/day	5.00E-03	mg/kg/day			3.6E-03
Dermal	Vanadium	42.2	mg/kg		mg/kg	M	1.2E-05	mg/kg/day	7.00E-03	mg/kg/day			1.7E-03
	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.37E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.37E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.62E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.12E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	2.62E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.50E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.00E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	7.49E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	3.63E-04	mg/kg/day	1.00E-01	mg/kg/day			3.6E-03
	Arsenic	3.5	mg/kg		mg/kg	M	1.40E-06	mg/kg/day	1.23E-04	mg/kg/day			1.1E-02
	Chromium	65	mg/kg		mg/kg	M	8.12E-07	mg/kg/day	1.00E-04	mg/kg/day			8.1E-03
	Vanadium	42.2	mg/kg		mg/kg	M	5.27E-07	mg/kg/day	7.00E-05	mg/kg/day			7.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													4.7E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

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TABLE D6-18B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Older Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	2.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	2.4E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	2.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	2.2E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	2.6E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	1.8E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	2.1E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	8.2E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	2.4E-03	mg/kg/day	1.00E+00	mg/kg/day			2.4E-03
	Arsenic	2.8	mg/kg		mg/kg	M	3.8E-07	mg/kg/day	3.00E-04	mg/kg/day			1.3E-03
	Chromium	40.725	mg/kg		mg/kg	M	5.6E-06	mg/kg/day	5.00E-03	mg/kg/day			1.1E-03
	Vanadium	36	mg/kg		mg/kg	M	4.9E-06	mg/kg/day	7.00E-03	mg/kg/day			7.0E-04
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	2.06E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	2.19E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	2.56E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	2.00E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	2.37E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	1.62E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	1.87E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	7.49E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	2.17E-04	mg/kg/day	1.00E-01	mg/kg/day			2.2E-03
	Arsenic	2.8	mg/kg		mg/kg	M	1.12E-06	mg/kg/day	1.23E-04	mg/kg/day			9.1E-03
	Chromium	40.725	mg/kg		mg/kg	M	5.08E-07	mg/kg/day	1.00E-04	mg/kg/day			5.1E-03
	Vanadium	36	mg/kg		mg/kg	M	4.50E-07	mg/kg/day	7.00E-05	mg/kg/day			6.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.8E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-19A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	3.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	3.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	3.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	3.0E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	3.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	3.5E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.1E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	5.1E-03	mg/kg/day	1.00E+00	mg/kg/day			5.1E-03
	Arsenic	3.5	mg/kg		mg/kg	M	6.2E-07	mg/kg/day	3.00E-04	mg/kg/day			2.1E-03
	Chromium	65	mg/kg		mg/kg	M	1.1E-05	mg/kg/day	5.00E-03	mg/kg/day			2.3E-03
	Vanadium	42.2	mg/kg		mg/kg	M	7.4E-06	mg/kg/day	7.00E-03	mg/kg/day			1.1E-03
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	1.92E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	1.92E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	2.13E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	1.72E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	2.13E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	2.03E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	1.62E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	6.08E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	2.95E-04	mg/kg/day	1.00E-01	mg/kg/day			2.9E-03
	Arsenic	2.8	mg/kg		mg/kg	M	1.13E-06	mg/kg/day	1.23E-04	mg/kg/day			9.2E-03
	Chromium	40.725	mg/kg		mg/kg	M	6.58E-07	mg/kg/day	1.00E-04	mg/kg/day			6.6E-03
	Vanadium	36	mg/kg		mg/kg	M	4.27E-07	mg/kg/day	7.00E-05	mg/kg/day			6.1E-03
Total Hazard Index Across All Exposure Routes/Pathways													3.5E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-19B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Trespasser
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.5E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.5E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.4E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	1.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.1E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	5.3E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	1.5E-03	mg/kg/day	1.00E+00	mg/kg/day			1.5E-03
	Arsenic	3.5	mg/kg		mg/kg	M	2.5E-07	mg/kg/day	3.00E-04	mg/kg/day			8.2E-04
	Chromium	65	mg/kg		mg/kg	M	3.8E-06	mg/kg/day	5.00E-03	mg/kg/day			7.2E-04
	Vanadium	42.2	mg/kg		mg/kg	M	3.2E-06	mg/kg/day	7.00E-03	mg/kg/day			4.5E-04
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	2.91E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	3.08E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	3.61E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	2.82E-08	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	3.35E-08	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	2.29E-09	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	2.64E-08	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.06E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	3.08E-05	mg/kg/day	1.00E-01	mg/kg/day			3.1E-04
	Arsenic	2.8	mg/kg		mg/kg	M	1.58E-07	mg/kg/day	1.23E-04	mg/kg/day			1.3E-03
	Chromium	40.725	mg/kg		mg/kg	M	7.17E-08	mg/kg/day	1.00E-04	mg/kg/day			7.2E-04
	Vanadium	36	mg/kg		mg/kg	M	6.34E-08	mg/kg/day	7.00E-05	mg/kg/day			9.1E-04
Total Hazard Index Across All Exposure Routes/Pathways													6.7E-03

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-20A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	9.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	9.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.0E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	8.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	1.0E-06	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	9.8E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	7.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.9E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	1.4E-02	mg/kg/day	1.00E+00	mg/kg/day			1.4E-02
	Arsenic	3.5	mg/kg		mg/kg	M	1.7E-06	mg/kg/day	3.00E-04	mg/kg/day			5.7E-03
	Chromium	65	mg/kg		mg/kg	M	3.2E-05	mg/kg/day	5.00E-03	mg/kg/day			6.4E-03
Dermal	Vanadium	42.2	mg/kg		mg/kg	M	2.1E-05	mg/kg/day	7.00E-03	mg/kg/day			2.9E-03
	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	4.28E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	4.28E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	4.73E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	3.83E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	4.73E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	4.50E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	3.60E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.35E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	6.55E-04	mg/kg/day	1.00E-01	mg/kg/day			6.5E-03
	Arsenic	3.5	mg/kg		mg/kg	M	2.52E-06	mg/kg/day	1.23E-04	mg/kg/day			2.0E-02
	Chromium	65	mg/kg		mg/kg	M	1.46E-06	mg/kg/day	1.00E-04	mg/kg/day			1.5E-02
	Vanadium	42.2	mg/kg		mg/kg	M	9.50E-07	mg/kg/day	7.00E-05	mg/kg/day			1.4E-02
Total Hazard Index Across All Exposure Routes/Pathways													8.4E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-20B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Occupational Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	8.1E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	8.6E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.0E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	7.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	9.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	6.4E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	7.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.9E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	8.5E-03	mg/kg/day	1.00E+00	mg/kg/day			8.5E-03
	Arsenic	3.5	mg/kg		mg/kg	M	1.4E-06	mg/kg/day	3.00E-04	mg/kg/day			4.6E-03
	Chromium	65.	mg/kg		mg/kg	M	2.0E-05	mg/kg/day	5.00E-03	mg/kg/day			4.0E-03
	Vanadium	42.2	mg/kg		mg/kg	M	1.8E-05	mg/kg/day	7.00E-03	mg/kg/day			2.5E-03
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	7.43E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	7.88E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	9.23E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	7.20E-08	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	8.55E-08	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	5.85E-09	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	6.75E-08	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.70E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	7.83E-05	mg/kg/day	1.00E-01	mg/kg/day			7.8E-04
	Arsenic	2.8	mg/kg		mg/kg	M	4.03E-07	mg/kg/day	1.23E-04	mg/kg/day			3.3E-03
	Chromium	40.725	mg/kg		mg/kg	M	1.83E-07	mg/kg/day	1.00E-04	mg/kg/day			1.8E-03
	Vanadium	36	mg/kg		mg/kg	M	1.62E-07	mg/kg/day	7.00E-05	mg/kg/day			2.3E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.8E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-21A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	5.6E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	5.6E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	6.2E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	5.0E-08	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	6.2E-08	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	5.9E-09	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	4.7E-08	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	1.8E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	8.5E-04	mg/kg/day	1.00E+00	mg/kg/day			8.5E-04
	Arsenic	3.5	mg/kg		mg/kg	M	1.0E-07	mg/kg/day	3.00E-04	mg/kg/day			3.4E-04
	Chromium	65	mg/kg		mg/kg	M	1.9E-06	mg/kg/day	5.00E-03	mg/kg/day			3.8E-04
	Vanadium	42.2	mg/kg		mg/kg	M	1.2E-06	mg/kg/day	7.00E-03	mg/kg/day			1.8E-04
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	7.70E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	7.70E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	8.51E-08	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	6.89E-08	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	8.51E-08	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	8.10E-09	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	6.48E-08	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.43E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	1.18E-04	mg/kg/day	1.00E-01	mg/kg/day			1.2E-03
	Arsenic	3.5	mg/kg		mg/kg	M	4.54E-07	mg/kg/day	1.23E-04	mg/kg/day			3.7E-03
	Chromium	65	mg/kg		mg/kg	M	2.63E-07	mg/kg/day	1.00E-04	mg/kg/day			2.6E-03
	Vanadium	42.2	mg/kg		mg/kg	M	1.71E-07	mg/kg/day	7.00E-05	mg/kg/day			2.4E-03
Total Hazard Index Across All Exposure Routes/Pathways													1.2E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-22A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.6E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.6E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.9E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.3E-06	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	2.9E-06	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.2E-06	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	8.2E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	4.0E-02	mg/kg/day	1.00E+00	mg/kg/day			4.0E-02
	Arsenic	3.5	mg/kg		mg/kg	M	4.8E-06	mg/kg/day	3.00E-04	mg/kg/day			1.6E-02
	Chromium	65	mg/kg		mg/kg	M	8.9E-05	mg/kg/day	5.00E-03	mg/kg/day			1.8E-02
	Vanadium	42.2	mg/kg		mg/kg	M	5.8E-05	mg/kg/day	7.00E-03	mg/kg/day			8.3E-03
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	1.51E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	1.51E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	1.67E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	1.35E-06	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	1.67E-06	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	1.59E-07	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.27E-06	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	4.77E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	2.31E-03	mg/kg/day	1.00E-01	mg/kg/day			2.3E-02
	Arsenic	3.5	mg/kg		mg/kg	M	8.90E-06	mg/kg/day	1.23E-04	mg/kg/day			7.2E-02
	Chromium	65	mg/kg		mg/kg	M	5.16E-06	mg/kg/day	1.00E-04	mg/kg/day			5.2E-02
	Vanadium	42.2	mg/kg		mg/kg	M	3.35E-06	mg/kg/day	7.00E-05	mg/kg/day			4.8E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.8E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-22B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	8.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	8.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	9.6E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	7.8E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	9.6E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	9.2E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	7.3E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.7E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	1.3E-02	mg/kg/day	1.00E+00	mg/kg/day			1.3E-02
	Arsenic	3.5	mg/kg		mg/kg	M	1.6E-06	mg/kg/day	3.00E-04	mg/kg/day			5.3E-03
	Chromium	65	mg/kg		mg/kg	M	3.0E-05	mg/kg/day	5.00E-03	mg/kg/day			6.0E-03
Dermal	Vanadium	42.2	mg/kg		mg/kg	M	1.9E-05	mg/kg/day	7.00E-03	mg/kg/day			2.8E-03
	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	1.74E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	1.74E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	1.92E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	1.56E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	1.92E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	1.83E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	1.47E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	5.50E-08	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	2.67E-04	mg/kg/day	1.00E-01	mg/kg/day			2.7E-03
	Arsenic	2.8	mg/kg		mg/kg	M	1.03E-06	mg/kg/day	1.23E-04	mg/kg/day			8.3E-03
	Chromium	40.725	mg/kg		mg/kg	M	5.95E-07	mg/kg/day	1.00E-04	mg/kg/day			6.0E-03
	Vanadium	36	mg/kg		mg/kg	M	3.86E-07	mg/kg/day	7.00E-05	mg/kg/day			5.5E-03
Total Hazard Index Across All Exposure Routes/Pathways													5.0E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-23A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.4E-05	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.4E-05	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.7E-05	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.2E-05	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	2.7E-05	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.6E-06	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	2.0E-05	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	7.7E-06	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	3.7E-01	mg/kg/day	1.00E+00	mg/kg/day			3.7E-01
	Arsenic	3.5	mg/kg		mg/kg	M	4.5E-05	mg/kg/day	3.00E-04	mg/kg/day			1.5E-01
	Chromium	65	mg/kg		mg/kg	M	8.3E-04	mg/kg/day	5.00E-03	mg/kg/day			1.7E-01
	Vanadium	42.2	mg/kg		mg/kg	M	5.4E-04	mg/kg/day	7.00E-03	mg/kg/day			7.7E-02
Dermal	Benzo(a)anthracene	1.9	mg/kg		mg/kg	M	2.33E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.9	mg/kg		mg/kg	M	2.33E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.1	mg/kg		mg/kg	M	2.57E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.7	mg/kg		mg/kg	M	2.08E-06	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	2.1	mg/kg		mg/kg	M	2.57E-06	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.2	mg/kg		mg/kg	M	2.45E-07	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.6	mg/kg		mg/kg	M	1.96E-06	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	7.35E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	29100	mg/kg		mg/kg	M	3.56E-03	mg/kg/day	1.00E-01	mg/kg/day			3.6E-02
	Arsenic	3.5	mg/kg		mg/kg	M	1.37E-05	mg/kg/day	1.23E-04	mg/kg/day			1.1E-01
	Chromium	65	mg/kg		mg/kg	M	7.96E-06	mg/kg/day	1.00E-04	mg/kg/day			8.0E-02
	Vanadium	42.2	mg/kg		mg/kg	M	5.17E-06	mg/kg/day	7.00E-05	mg/kg/day			7.4E-02
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+00

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-23B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Site 6
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	8.1E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	8.1E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	9.0E-06	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	7.3E-06	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	9.0E-06	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	8.5E-07	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	6.8E-06	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.6E-06	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	1.2E-01	mg/kg/day	1.00E+00	mg/kg/day			1.2E-01
	Arsenic	2.8	mg/kg		mg/kg	M	1.5E-05	mg/kg/day	3.00E-04	mg/kg/day			5.0E-02
	Chromium	40.725	mg/kg		mg/kg	M	2.8E-04	mg/kg/day	5.00E-03	mg/kg/day			5.6E-02
	Vanadium	36	mg/kg		mg/kg	M	1.8E-04	mg/kg/day	7.00E-03	mg/kg/day			2.6E-02
Dermal	Benzo(a)anthracene	1.65	mg/kg		mg/kg	M	8.08E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(a)pyrene	1.75	mg/kg		mg/kg	M	8.08E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(b)fluoranthene	2.05	mg/kg		mg/kg	M	8.93E-07	mg/kg/day	NA	mg/kg/day			NA
	Benzo(k)fluoranthene	1.6	mg/kg		mg/kg	M	7.23E-07	mg/kg/day	NA	mg/kg/day			NA
	Chrysene	1.9	mg/kg		mg/kg	M	8.93E-07	mg/kg/day	NA	mg/kg/day			NA
	Dibenzo(a,h)anthracene	0.1265	mg/kg		mg/kg	M	8.50E-08	mg/kg/day	NA	mg/kg/day			NA
	Indeno(1,2,3-cd)pyrene	1.5	mg/kg		mg/kg	M	6.80E-07	mg/kg/day	NA	mg/kg/day			NA
	Aroclor-1260	0.6	mg/kg		mg/kg	M	2.55E-07	mg/kg/day	NA	mg/kg/day			NA
	Aluminum	17390	mg/kg		mg/kg	M	1.24E-03	mg/kg/day	1.00E-01	mg/kg/day			1.2E-02
	Arsenic	2.8	mg/kg		mg/kg	M	4.76E-06	mg/kg/day	1.23E-04	mg/kg/day			3.9E-02
	Chromium	40.725	mg/kg		mg/kg	M	2.76E-06	mg/kg/day	1.00E-04	mg/kg/day			2.8E-02
	Vanadium	36	mg/kg		mg/kg	M	1.79E-06	mg/kg/day	7.00E-05	mg/kg/day			2.6E-02
Total Hazard Index Across All Exposure Routes/Pathways													3.6E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-24
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil - Grass Area
Exposure Point: Site 30
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	41600	mg/kg		mg/kg	M	2.3E-02	mg/kg/day	1.00E+00	mg/kg/day			2.3E-02
	Arsenic	4.8	mg/kg		mg/kg	M	2.7E-06	mg/kg/day	3.00E-04	mg/kg/day			9.0E-03
	Vanadium	63.7	mg/kg		mg/kg	M	3.6E-05	mg/kg/day	7.00E-03	mg/kg/day			5.1E-03
	Chromium	30.7	mg/kg		mg/kg	M	1.7E-05	mg/kg/day	5.00E-03	mg/kg/day			3.5E-03
Dermal	Aluminum	41600	mg/kg		mg/kg	M	2.81E-04	mg/kg/day	1.00E-01	mg/kg/day			2.8E-03
	Arsenic	4.8	mg/kg		mg/kg	M	1.04E-06	mg/kg/day	1.23E-04	mg/kg/day			8.4E-03
	Vanadium	63.7	mg/kg		mg/kg	M	4.30E-07	mg/kg/day	7.00E-05	mg/kg/day			6.1E-03
	Chromium	30.7	mg/kg		mg/kg	M	2.07E-07	mg/kg/day	1.00E-04	mg/kg/day			2.1E-03
Total Hazard Index Across All Exposure Routes/Pathways													6.0E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-25A
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 30
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil - Grass Area
 Exposure Point: Site 30
 Receptor Population: Resident
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	41600	mg/kg		mg/kg	M	5.7E-02	mg/kg/day	1.00E+00	mg/kg/day			5.7E-02
	Arsenic	4.8	mg/kg		mg/kg	M	6.6E-06	mg/kg/day	3.00E-04	mg/kg/day			2.2E-02
	Vanadium	63.7	mg/kg		mg/kg	M	8.7E-05	mg/kg/day	7.00E-03	mg/kg/day			1.2E-02
	Chromium	30.7	mg/kg		mg/kg	M	4.2E-05	mg/kg/day	5.00E-03	mg/kg/day			8.4E-03
Dermal	Aluminum	41600	mg/kg		mg/kg	M	3.31E-03	mg/kg/day	1.00E-01	mg/kg/day			3.3E-02
	Arsenic	4.8	mg/kg		mg/kg	M	1.22E-05	mg/kg/day	1.23E-04	mg/kg/day			9.9E-02
	Vanadium	63.7	mg/kg		mg/kg	M	5.06E-06	mg/kg/day	7.00E-05	mg/kg/day			7.2E-02
	Chromium	30.7	mg/kg		mg/kg	M	2.44E-06	mg/kg/day	1.00E-04	mg/kg/day			2.4E-02
Total Hazard Index Across All Exposure Routes/Pathways													3.3E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-25B
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil -Grass Area
Exposure Point: Site 30
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	23767	mg/kg		mg/kg	M	1.1E-02	mg/kg/day	1.00E+00	mg/kg/day			1.1E-02
	Arsenic	3.9	mg/kg		mg/kg	M	1.8E-06	mg/kg/day	3.00E-04	mg/kg/day			6.0E-03
	Vanadium	46.3	mg/kg		mg/kg	M	2.1E-05	mg/kg/day	7.00E-03	mg/kg/day			3.0E-03
	Chromium	21.4	mg/kg		mg/kg	M	9.8E-06	mg/kg/day	5.00E-03	mg/kg/day			2.0E-03
Dermal	Aluminum	23767	mg/kg		mg/kg	M	2.18E-04	mg/kg/day	1.00E-01	mg/kg/day			2.2E-03
	Arsenic	3.9	mg/kg		mg/kg	M	1.14E-06	mg/kg/day	1.23E-04	mg/kg/day			9.3E-03
	Vanadium	46.3	mg/kg		mg/kg	M	4.24E-07	mg/kg/day	7.00E-05	mg/kg/day			6.1E-03
	Chromium	21.4	mg/kg		mg/kg	M	1.96E-07	mg/kg/day	1.00E-04	mg/kg/day			2.0E-03
Total Hazard Index Across All Exposure Routes/Pathways													4.1E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-26A
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil - Grass Area
Exposure Point: Site 30
Receptor Population: Resident
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	41600	mg/kg		mg/kg	M	5.3E-01	mg/kg/day	1.00E+00	mg/kg/day			5.3E-01
	Arsenic	4.8	mg/kg		mg/kg	M	6.1E-05	mg/kg/day	3.00E-04	mg/kg/day			2.0E-01
	Vanadium	63.7	mg/kg		mg/kg	M	8.1E-04	mg/kg/day	7.00E-03	mg/kg/day			1.2E-01
	Chromium	30.7	mg/kg		mg/kg			mg/kg/day	5.00E-03	mg/kg/day			7.9E-02
Dermal	Aluminum	41600	mg/kg		mg/kg	M	5.09E-03	mg/kg/day	1.00E-01	mg/kg/day			5.1E-02
	Arsenic	4.8	mg/kg		mg/kg	M	1.88E-05	mg/kg/day	1.23E-04	mg/kg/day			1.5E-01
	Vanadium	63.7	mg/kg		mg/kg	M	7.80E-06	mg/kg/day	7.00E-05	mg/kg/day			1.1E-01
	Chromium	30.7	mg/kg		mg/kg	M	7.80E-06	mg/kg/day	1.00E-04	mg/kg/day			3.8E-02
Total Hazard Index Across All Exposure Routes/Pathways													1.3E+00

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-26B
 CALCULATION OF NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURE
 SITE 30
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Surface Soil - Grass Area
 Exposure Point: Site 30
 Receptor Population: Resident
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	23767	mg/kg		mg/kg	M	1.0E-01	mg/kg/day	1.00E+00	mg/kg/day			1.0E-01
	Arsenic	3.9	mg/kg		mg/kg	M	1.7E-05	mg/kg/day	3.00E-04	mg/kg/day			5.6E-02
	Vanadium	46.3	mg/kg		mg/kg	M	2.0E-04	mg/kg/day	7.00E-03	mg/kg/day			2.8E-02
	Chromium	21.4	mg/kg		mg/kg	M	9.1E-05	mg/kg/day	5.00E-03	mg/kg/day			1.8E-02
Dermal	Aluminum	23767	mg/kg		mg/kg	M	1.01E-03	mg/kg/day	1.00E-01	mg/kg/day			1.0E-02
	Arsenic	3.9	mg/kg		mg/kg	M	5.30E-06	mg/kg/day	1.23E-04	mg/kg/day			4.3E-02
	Vanadium	46.3	mg/kg		mg/kg	M	1.97E-06	mg/kg/day	7.00E-05	mg/kg/day			2.8E-02
	Chromium	21.4	mg/kg		mg/kg	M	9.10E-07	mg/kg/day	1.00E-04	mg/kg/day			9.1E-03
Total Hazard Index Across All Exposure Routes/Pathways													2.9E-01

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-27
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 30
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Subsurface Soil
 Exposure Point: Site 30
 Receptor Population: Construction Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	5.9	mg/kg		mg/kg	M	3.3E-06	mg/kg/day	3.00E-04	mg/kg/day			1.1E-02
Dermal	Arsenic	5.9	mg/kg		mg/kg	M	1.27E-06	mg/kg/day	1.23E-04	mg/kg/day			1.0E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.1E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

TABLE D6-28
 CALCULATION OF NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURE
 SITE 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Medium: Soil
 Exposure Medium: Subsurface Soil
 Exposure Point: Site 33
 Receptor Population: Construction Worker
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	7.3	mg/kg		mg/kg	M	4.1E-06	mg/kg/day	3.00E-04	mg/kg/day			1.4E-02
Dermal	Arsenic	7.3	mg/kg		mg/kg	M	1.58E-06	mg/kg/day	1.23E-04	mg/kg/day			1.3E-02
Total Hazard Index Across All Exposure Routes/Pathways													2.7E-02

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Values are for chronic exposure.

EPC - Exposure Point Concentrations

mg/kg - milligram per kilogram

mg/kg/day - milligram per kilogram per day

APPENDIX D7

SUMMARY OF RECEPTOR RISKS AND HAZARDS

TABLE D7-1A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 3	Dieldrin	2.76E-08	--	2.51E-08	5.27E-08	Dieldrin	liver	0.0002	--	0.0002	0.0005	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0059	--	0.0027	0.0086	
			Arsenic	3.23E-07	--	1.15E-06	1.47E-06	Arsenic	skin	0.0050	--	0.0179	0.0229	
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0023	--	0.0053	0.0077	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0013	--	0.0061	0.0074	
			(Total)	3.50E-07		1.2E-06	1.52E-06	(Total)		0.0148		0.0322	0.0470	
Total Risk Across Soil							1.52E-06		Total Hazard Index Across All Media and All Exposure Routes					0.0470
Total Risk Across All Media and All Exposure Routes							1.52E-06							

Total Liver HI = 0.0005
Total Skin HI = 0.023
Total CNS HI = 0.009

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-1B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	8.77E-10	--	1.60E-09	2.48E-09	Dieldrin	liver	0.0000	--	0.0001	0.0001
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0015	--	0.0014	0.0029
			Arsenic	1.37E-08	--	9.78E-08	1.12E-07	Arsenic	skin	0.0011	--	0.0076	0.0087
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0004	--	0.0016	0.0019
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0004	--	0.0034	0.0038
			(Total)	1.46E-08		9.9E-08	1.14E-07	(Total)		0.0034		0.0141	0.0174
Total Risk Across Soil							1.14E-07		Total Hazard Index Across All Media and All Exposure Routes				0.0174
Total Risk Across All Media and All Exposure Routes							1.14E-07						

Total Liver HI = 0.0001
Total Skin HI = 0.009
Total CNS HI = 0.003

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-2A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	3.54E-08	--	4.07E-08	7.62E-08	Dieldrin	liver	0.0002	--	0.0002	0.0003
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0038	--	0.0022	0.0060
			Arsenic	4.15E-07	--	1.86E-06	2.28E-06	Arsenic	skin	0.0032	--	0.0145	0.0177
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0015	--	0.0043	0.0058
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0009	--	0.0049	0.0058
			(Total)	4.51E-07		1.90E-06	2.36E-06	(Total)		0.0095		0.0261	0.0356
			Total Risk Across Soil				2.36E-06	Total Hazard Index Across All Media and All Exposure Routes					
Total Risk Across All Media and All Exposure Routes				2.36E-06									

Total Liver HI = 0.0003
Total CNS HI = 0.006
Total Skin HI = 0.018

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-2B
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	1.97E-09	--	7.89E-10	2.76E-09	Dieldrin	liver	0.00002	--	0.00001	0.00003
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0010	--	0.0002	0.0012
			Arsenic	3.09E-08	--	4.83E-08	7.92E-08	Arsenic	skin	0.0007	--	0.0011	0.0018
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0002	--	0.0002	0.0005
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0002	--	0.0005	0.0007
			(Total)	3.29E-08		4.91E-08	8.19E-08	(Total)		0.0022		0.0020	0.0041
Total Risk Across Soil							8.19E-08	Total Hazard Index Across All Media and All Exposure Routes					0.004
Total Risk Across All Media and All Exposure Routes							8.19E-08						

Total Liver HI = 0.00003

Total CNS HI = 0.001

Total Skin HI = 0.002

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-3A
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
 REASONABLE MAXIMUM EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Occupational Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 3	Dieldrin	1.23E-07	--	1.13E-07	2.36E-07	Dieldrin	liver	0.0004	--	0.0004	0.0008		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0105	--	0.0048	0.0154		
			Arsenic	1.44E-06	--	5.18E-06	6.62E-06	Arsenic	skin	0.0090	--	0.0322	0.0412		
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0042	--	0.0096	0.0138		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0024	--	0.0109	0.0133		
			(Total)	1.56E-06		5.29E-06	6.86E-06	(Total)		0.0265		0.0580	0.0845		
Total Risk Across Soil							6.86E-06		Total Hazard Index Across All Media and All Exposure Routes					0.0845	
Total Risk Across All Media and All Exposure Routes							6.86E-06								

Total Liver HI =	0.001
Total CNS HI =	0.015
Total Skin HI =	0.041

NA - Not Applicable
 CNS - Central Nervous System
 NOEL - No Observable Effect Level
 HI - Hazard Index

TABLE D7-3B
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Occupational Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	1.41E-08	--	2.59E-09	1.67E-08	Dieldrin	liver	0.0001	--	0.00003	0.0002
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0055	--	0.0005	0.0060
			Arsenic	2.21E-07	--	1.59E-07	3.79E-07	Arsenic	skin	0.0038	--	0.0027	0.0066
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0013	--	0.0006	0.0018
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0013	--	0.0012	0.0025
			(Total)	2.35E-07		1.61E-07	3.96E-07	(Total)		0.0120		0.0051	0.0171
Total Risk Across Soil							3.96E-07	Total Hazard Index Across All Media and All Exposure Routes					0.0171
Total Risk Across All Media and All Exposure Routes							3.96E-07						

Total Liver HI = 0.0002

Total CNS HI = 0.006

Total Skin HI = 0.007

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	3.69E-09	--	2.04E-08	2.41E-08	Dieldrin	liver	0.00001	--	0.0001	0.0001
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.00032	--	0.0009	0.0012
			Arsenic	4.32E-08	--	9.32E-07	9.75E-07	Arsenic	skin	0.00027	--	0.0058	0.0061
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.00013	--	0.0017	0.0019
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.00007	--	0.0020	0.0020
			(Total)	4.69E-08		9.52E-07	9.99E-07	(Total)		0.00079		0.0104	0.0112
Total Risk Across Soil							9.99E-07		Total Hazard Index Across All Media and All Exposure Routes				0.0112
Total Risk Across All Media and All Exposure Routes							9.99E-07						

Total Liver HI = 0.0001
Total CNS HI = 0.0012
Total Skin HI = 0.0061

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-5A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	5.67E-09	--	1.36E-09	7.03E-09	Dieldrin	liver	0.0005	--	0.0001	0.0006
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0121	--	0.0015	0.0136
			Arsenic	6.64E-08	--	6.21E-08	1.29E-07	Arsenic	skin	0.0103	--	0.0097	0.0200
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0048	--	0.0029	0.0077
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0027	--	0.0033	0.0060
			(Total)	7.21E-08	--	6.35E-08	1.36E-07	(Total)		0.0305	--	0.0174	0.0479
Soil	Subsurface Soil	Site 3	Arsenic	8.00E-08	--	7.50E-08	1.55E-07	Arsenic	skin	0.0120	--	0.0120	0.0240
			(Total)				(Total)		0.0120		0.0120	0.0240	
Total Risk Across Surface Soil							1.36E-07	Total Hazard Index Across All Media and All Exposure Routes					0.0719
Total Risk Across Subsurface Soil							1.55E-07						
Total Risk Across All Media and All Exposure Routes							2.91E-07						

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total Liver HI =	0.001
Total CNS HI =	0.014
Total Skin HI =	0.020

TABLE D7-6A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 3	Dieldrin	1.10E-06	--	5.30E-07	1.63E-06	Dieldrin	liver	0.0012	--	0.0014	0.0026		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0295	--	0.0171	0.0465		
			Arsenic	1.29E-05	--	2.48E-05	3.77E-05	Arsenic	skin	0.0251	--	0.1137	0.1388		
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0117	--	0.0339	0.0456		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0067	--	0.0386	0.0452		
			(Total)	1.40E-05		2.53E-05	3.93E-05	(Total)		0.0741		0.2047	0.2788		
Total Risk Across Soil							3.93E-05		Total Hazard Index Across All Media and All Exposure Routes					0.2788	
Total Risk Across All Media and All Exposure Routes							3.93E-05								

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

Total Liver HI =	0.003
Total CNS HI =	0.047
Total Skin HI =	0.139

TABLE D7-6B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	3.70E-08	--	9.50E-09	4.65E-08	Dieldrin	liver	0.0001	--	0.0001	0.0002
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0051	--	0.0010	0.0061
			Arsenic	5.90E-07	--	5.80E-07	1.17E-06	Arsenic	skin	0.0036	--	0.0056	0.0091
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.0012	--	0.0012	0.0023
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0012	--	0.0025	0.0037
			(Total)	6.27E-07		5.90E-07	1.22E-06	(Total)		0.0112		0.0103	0.0215
Total Risk Across Soil							1.22E-06						
Total Risk Across All Media and All Exposure Routes							1.22E-06						
Total Hazard Index Across All Media and All Exposure Routes								0.0215					

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total Liver HI = 0.0002
Total CNS HI = 0.006
Total Skin HI = 0.009

D7-7A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	NA	--	NA	NA	Dieldrin	liver	0.011	--	0.002	0.013
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.275	--	0.028	0.301
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.234	--	0.175	0.410
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.109	--	0.052	0.181
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.062	--	0.059	0.122
			(Total)	NA		NA	NA	(Total)		0.692		0.315	1.007
			Total Risk Across Soil				NA	Total Hazard Index Across All Media and All Exposure Routes					
Total Risk Across All Media and All Exposure Routes				NA									

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

Total Liver HI =	0.013
Total CNS HI =	0.301
Total Skin HI =	0.410

TABLE D7-7B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 3
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 3	Dieldrin	NA	--	NA	NA	Dieldrin	liver	0.001	--	0.00024	0.001	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.048	--	0.0047	0.053	
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.033	--	0.026	0.059	
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.011	--	0.00540	0.016	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.012	--	0.01200	0.024	
			(Total)	NA		NA	NA	(Total)		0.105		0.04834	0.154	
Total Risk Across Soil							NA		Total Hazard Index Across All Media and All Exposure Routes					0.154
Total Risk Across All Media and All Exposure Routes							NA							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total Liver HI = 0.001

Total CNS HI = 0.053

Total Skin HI = 0.059

TABLE D7-9A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 4	Dieldrin	5.32E-08	--	4.85E-08	1.02E-07	Dieldrin	liver	0.0005	--	0.0004	0.0009		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.005	--	0.002	0.008		
			Arsenic	2.23E-07	--	7.94E-07	1.02E-06	Arsenic	skin	0.003	--	0.012	0.016		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.001	--	0.005	0.006		
			(Total)	2.76E-07		8.43E-07	1.12E-06	(Total)		0.010		0.020	0.030		
Total Risk Across Soil							1.12E-06		Total Hazard Index Across All Media and All Exposure Routes					0.030	
Total Risk Across All Media and All Exposure Routes							1.12E-06								

Total Liver HI = 0.001
Total CNS HI = 0.008
Total Skin HI = 0.016

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-9B
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 4	Dieldrin	5.32E-09	--	9.71E-09	1.50E-08	Dieldrin	liver	0.0002	--	0.0004	0.0007		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.003	--	0.002	0.005		
			Arsenic	2.23E-08	--	1.59E-07	1.81E-07	Arsenic	skin	0.002	--	0.012	0.014		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.001	--	0.005	0.005		
			(Total)	2.76E-08		1.69E-07	1.96E-07	(Total)		0.005		0.020	0.025		
Total Risk Across Soil							1.96E-07		Total Hazard Index Across All Media and All Exposure Routes					0.025	
Total Risk Across All Media and All Exposure Routes							1.96E-07								

Total Liver HI = 0.001
 Total CNS HI = 0.005
 Total Skin HI = 0.014

NA - Not Applicable
 CNS - Central Nervous System
 NOEL - No Observable Effect Level
 HI - Hazard Index

TABLE D7-10A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 4	Dieldrin	6.84E-08	--	7.87E-08	1.47E-07	Dieldrin	liver	0.0003	--	0.0003	0.0006	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0033	--	0.0019	0.0052	
			Arsenic	2.87E-07	--	1.29E-06	1.57E-06	Arsenic	skin	0.0022	--	0.0100	0.0122	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0007	--	0.0039	0.0046	
			(Total)	3.55E-07		1.37E-06	1.72E-06	(Total)		0.0065		0.0162	0.0227	
Total Risk Across Soil							1.72E-06		Total Hazard Index Across All Media and All Exposure Routes					0.023
Total Risk Across All Media and All Exposure Routes							1.72E-06							

Total Liver HI = 0.001
Total CNS HI = 0.005
Total Skin HI = 0.012

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-10B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	1.20E-08	--	4.79E-09	1.68E-08	Dieldrin	liver	0.0001	--	0.0001	0.0002
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0017	--	0.0003	0.0020
			Arsenic	5.02E-08	--	7.84E-08	1.29E-07	Arsenic	skin	0.0011	--	0.0017	0.0029
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0003	--	0.0007	0.0010
			(Total)	6.22E-08		8.32E-08	1.45E-07	(Total)		0.0033		0.0028	0.0061
			Total Risk Across Soil							Total Hazard Index Across All Media and All Exposure Routes			
Total Risk Across All Media and All Exposure Routes													

Total Liver HI = 0.0002
Total CNS HI = 0.002
Total Skin HI = 0.003

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-11A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	2.38E-07	--	2.19E-07	4.56E-07	Dieldrin	liver	0.0008	--	0.0008	0.0016
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0093	--	0.0043	0.0135
			Arsenic	9.96E-07	--	3.58E-06	4.57E-06	Arsenic	skin	0.0062	--	0.0222	0.0284
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0019	--	0.0086	0.0105
			(Total)	1.23E-06		3.80E-06	5.03E-06	(Total)		0.0182		0.0359	0.0541
Total Risk Across Soil							Total Hazard Index Across All Media and All Exposure Routes						
Total Risk Across All Media and All Exposure Routes							0.054						

Total Liver HI = 0.002
Total CNS HI = 0.014
Total Skin HI = 0.028

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-11B
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Occupational Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	8.55E-08	--	1.57E-08	1.01E-07	Dieldrin	liver	0.0008	--	0.0002	0.0010
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0093	--	0.0009	0.0101
			Arsenic	3.59E-07	--	2.58E-07	6.16E-07	Arsenic	skin	0.0062	--	0.0044	0.0106
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0019	--	0.0017	0.0036
			(Total)	4.44E-07		2.73E-07	7.17E-07	(Total)		0.0182		0.0072	0.0253
Total Risk Across Soil							7.17E-07	Total Hazard Index Across All Media and All Exposure Routes					0.025
Total Risk Across All Media and All Exposure Routes							7.17E-07						

Total Liver HI = 0.001
 Total CNS HI = 0.010
 Total Skin HI = 0.011

NA - Not Applicable
 CNS - Central Nervous System
 NOEL - No Observable Effect Level
 HI - Hazard Index

TABLE D7-12A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	1.43E-08	--	3.94E-08	5.36E-08	Dieldrin	liver	0.00005	--	0.0001	0.0002
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.00056	--	0.0008	0.0013
			Arsenic	5.98E-08	--	6.44E-07	7.04E-07	Arsenic	skin	0.00037	--	0.0040	0.0044
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.00011	--	0.0016	0.0017
			(Total)	7.40E-08		6.83E-07	7.57E-07	(Total)		0.00109		0.0065	0.0076
Total Risk Across Soil							7.57E-07	Total Hazard Index Across All Media and All Exposure Routes					0.0076
Total Risk Across All Media and All Exposure Routes							7.57E-07						

Total Liver HI = 0.0002
Total CNS HI = 0.0013
Total Skin HI = 0.0044

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-13A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	1.09E-08	--	2.62E-09	1.36E-08	Dieldrin	liver	0.001	--	0.0002	0.001
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.011	--	0.001	0.012
			Arsenic	4.59E-08	--	4.29E-08	8.88E-08	Arsenic	skin	0.007	--	0.007	0.014
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.002	--	0.003	0.005
			(Total)	5.68E-08		4.55E-08	1.02E-07	(Total)		0.021		0.011	0.032
Soil	Subsurface Soil (2 to 22 feet)	Site 4	Benzo(a)anthracene	1.12E-08	--	NA	1.12E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	6.47E-08	--	NA	6.47E-08	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	7.05E-09	--	NA	7.05E-09	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	3.47E-10	--	NA	3.47E-10	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	5.52E-11	--	NA	5.52E-11	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	1.35E-08	--	NA	1.35E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	7.05E-10	--	NA	7.05E-10	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Arsenic	7.73E-08	--	7.23E-08	7.73E-08	Arsenic	skin	0.012	--	0.011	0.023
			(Total)	1.75E-07		7.23E-08	1.75E-07	(Total)		0.012		0.011	0.023
Total Risk Across Surface Soil						1.02E-07	Total Hazard Index Across All Media and All Exposure Routes						0.055
Total Risk Across Subsurface Soil						1.75E-07							
Total Risk Across All Media and All Exposure Routes						2.77E-07							

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total Liver HI =	0.001
Total CNS HI =	0.012
Total Skin HI =	0.037

TABLE D7-13B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	1.09E-08	--	2.62E-09	1.36E-08	Dieldrin	liver	0.001	--	0.0002	0.001
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.011	--	0.001	0.012
			Arsenic	4.59E-08	--	4.29E-08	8.88E-08	Arsenic	skin	0.007	--	0.007	0.014
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.002	--	0.003	0.005
			(Total)	5.68E-08		4.55E-08	1.02E-07	(Total)		0.021		0.011	0.032
Soil	Subsurface Soil (2 to 15 feet)	Site 4	Arsenic	7.73E-08	--	7.23E-08	1.50E-07	Arsenic	skin	0.012	--	0.011	0.023
			(Total)	7.73E-08		7.23E-08	1.50E-07	(Total)		0.012		0.011	0.023
Total Risk Across Surface Soil							1.02E-07	Total Hazard Index Across All Media and All Exposure Routes					0.055
Total Risk Across Subsurface Soil							1.50E-07						
Total Risk Across All Media and All Exposure Routes							2.52E-07						

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total Liver HI = 0.001
Total CNS HI = 0.012
Total Skin HI = 0.037

TABLE D7-14A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	2.14E-06	--	1.03E-06	3.17E-06	Dieldrin	liver	0.002	--	0.003	0.005
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.028	--	0.015	0.041
			Arsenic	8.90E-06	--	1.67E-05	2.56E-05	Arsenic	skin	0.017	--	0.079	0.096
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.005	--	0.031	0.036
			(Total)	1.10E-05		1.77E-05	2.88E-05	(Total)		0.051		0.127	0.178
Total Risk Across Soil							2.88E-05	Total Hazard Index Across All Media and All Exposure Routes					0.178
Total Risk Across All Media and All Exposure Routes							2.88E-05						

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total Liver HI = 0.005
Total Skin HI = 0.096

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-14B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 4	Dieldrin	2.30E-07	--	5.80E-08	2.88E-07	Dieldrin	liver	0.00078	--	0.00031	0.001	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.0087	--	0.0017	0.010	
			Arsenic	9.60E-07	--	9.50E-07	1.91E-06	Arsenic	skin	0.0058	--	0.0091	0.015	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0018	--	0.0035	0.005	
			(Total)	1.19E-06		1.01E-06	2.20E-06	(Total)		0.017		0.015	0.032	
Total Risk Across Soil							2.20E-06		Total Hazard Index Across All Media and All Exposure Routes					0.032
Total Risk Across All Media and All Exposure Routes							2.20E-06							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total Liver HI = 0.001

Total Skin HI = 0.015

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-15A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	NA	--	NA	NA	Dieldrin	liver	0.022	--	0.004	0.026
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.242	--	0.023	0.265
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.162	--	0.121	0.263
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.049	--	0.047	0.096
			(Total)	NA		NA	NA	(Total)		0.475		0.195	0.670
Total Risk Across Soil						NA	Total Hazard Index Across All Media and All Exposure Routes						0.670
Total Risk Across All Media and All Exposure Routes						NA							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total Liver HI =	0.026
Total CNS HI =	0.265
Total Skin HI =	0.283

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-15B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 4
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	NA	--	NA	NA	Dieldrin	liver	0.0073	--	0.0014	0.009
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.081	--	0.008	0.089
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.054	--	0.042	0.096
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.016	--	0.016	0.032
			(Total)	NA		NA	NA	(Total)		0.158		0.067	0.226
Total Risk Across Soil							NA	Total Hazard Index Across All Media and All Exposure Routes					0.226
Total Risk Across All Media and All Exposure Routes							NA						

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total Liver HI = 0.009
Total CNS HI = 0.089
Total Skin HI = 0.096

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-17A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	5.43E-08	--	NA	5.43E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	5.43E-07	--	NA	5.43E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	6.00E-08	--	NA	6.00E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	4.86E-09	--	NA	4.86E-09	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	6.00E-10	--	NA	6.00E-10	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	5.71E-08	--	NA	5.71E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	4.57E-08	--	NA	4.57E-08	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	4.70E-08	--	2.4E-08	7.07E-08	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.008	--	0.004	0.012
			Arsenic	2.05E-07	--	7.3E-07	9.37E-07	Arsenic	skin	0.003	--	0.011	0.015
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.004	--	0.008	0.012
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.002	--	0.008	0.009
			(Total)	1.02E-06		7.8E-07	1.77E-06	(Total)		0.016		0.031	0.047
Total Risk Across Soil							1.77E-06	Total Hazard Index Across All Media and All Exposure Routes					0.047
Total Risk Across All Media and All Exposure Routes							1.77E-06						

Total CNS HI = 0.012
Total Skin HI = 0.015

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

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TABLE D7-17B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 6	Benzo(a)anthracene	4.71E-09	--	NA	4.71E-09	Benzo(a)anthracene	carcinogen	NA	--	NA	NA		
			Benzo(a)pyrene	5.00E-08	--	NA	5.00E-08	Benzo(a)pyrene	carcinogen	NA	--	NA	NA		
			Benzo(b)fluoranthene	5.86E-09	--	NA	5.86E-09	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA		
			Benzo(k)fluoranthene	4.57E-10	--	NA	4.57E-10	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA		
			Chrysene	5.43E-11	--	NA	5.43E-11	Chrysene	carcinogen	NA	--	NA	NA		
			Dibenzo(a,h)anthracene	3.71E-09	--	NA	3.71E-09	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA		
			Indeno(1,2,3-cd)pyrene	4.29E-09	--	NA	4.29E-09	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA		
			Aroclor-1260	4.70E-09	--	4.8E-09	9.45E-09	Aroclor-1260	carcinogen	NA	--	NA	NA		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.002	--	0.002	0.005		
			Arsenic	1.64E-08	--	1.2E-07	1.33E-07	Arsenic	skin	0.001	--	0.009	0.010		
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.001	--	0.005	0.006		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.001	--	0.006	0.007		
			(Total)	9.02E-08		1.2E-07	2.12E-07	(Total)		0.005		0.023	0.028		
Total Risk Across Soil							2.12E-07	Total Hazard Index Across All Media and All Exposure Routes							0.028
Total Risk Across All Media and All Exposure Routes							2.12E-07								

Total CNS HI = 0.005
Total Skin HI = 0.010

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-18A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 6	Benzo(a)anthracene	6.98E-08	--	NA	6.98E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA		
			Benzo(a)pyrene	6.98E-07	--	NA	6.98E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	NA		
			Benzo(b)fluoranthene	7.71E-08	--	NA	7.71E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA		
			Benzo(k)fluoranthene	6.24E-09	--	NA	6.24E-09	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA		
			Chrysene	7.71E-10	--	NA	7.71E-10	Chrysene	carcinogen	NA	--	NA	NA		
			Dibenzo(a,h)anthracene	7.35E-08	--	NA	7.35E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA		
			Indeno(1,2,3-cd)pyrene	5.88E-08	--	NA	5.9E-08	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA		
			Aroclor-1260	6.04E-08	--	3.9E-08	9.9E-08	Aroclor-1260	carcinogen	NA	--	NA	NA		
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.005	--	0.003	0.008		
			Arsenic	2.64E-07	--	1.19E-06	1.45E-06	Arsenic	skin	0.002	--	0.009	0.011		
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.002	--	0.007	0.009		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.001	--	0.006	0.007		
			(Total)	1.31E-06		1.22E-06	2.53E-06				(Total)	0.011		0.025	0.035
Total Risk Across Soil							2.53E-06	Total Hazard Index Across All Media and All Exposure Routes							0.035
Total Risk Across All Media and All Exposure Routes							2.53E-06								

Total CNS HI = 0.008
Total Skin HI = 0.011

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-18B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	1.06E-08	--	NA	1.06E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	1.13E-07	--	NA	1.13E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	1.32E-08	--	NA	1.32E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	1.03E-09	--	NA	1.03E-09	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	1.22E-10	--	NA	1.22E-10	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	8.36E-09	--	NA	8.36E-09	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	9.64E-09	--	NA	9.6E-09	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	1.06E-08	--	2.3E-09	1.3E-08	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.002	--	0.0003	0.002
			Arsenic	3.70E-08	--	5.78E-08	9.47E-08	Arsenic	skin	0.001	--	0.001	0.002
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.001	--	0.001	0.001
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.0005	--	0.001	0.001
			(Total)	2.03E-07		6.01E-08	2.63E-07	(Total)		0.004		0.003	0.007
Total Risk Across Soil							2.63E-07	Total Hazard Index Across All Media and All Exposure Routes					0.007
Total Risk Across All Media and All Exposure Routes							2.63E-07						

Total CNS HI = 0.002

Total Skin HI = 0.002

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-19A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	2.42E-07	--	NA	2.42E-07	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	2.42E-06	--	NA	2.42E-06	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	2.68E-07	--	NA	2.68E-07	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	2.17E-08	--	NA	2.17E-08	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	2.68E-09	--	NA	2.68E-09	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	2.55E-07	--	NA	2.55E-07	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	2.04E-07	--	NA	2.04E-07	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	2.10E-07	--	1.07E-07	3.17E-07	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.014	--	0.007	0.021
			Arsenic	9.17E-07	--	3.29E-06	4.21E-06	Arsenic	skin	0.006	--	0.020	0.026
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.006	--	0.015	0.021
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.003	--	0.014	0.017
			(Total)	4.54E-06	--	3.40E-06	7.95E-06	(Total)		0.029	--	0.055	0.084
Total Risk Across Soil						7.95E-06	Total Hazard Index Across All Media and All Exposure Routes						0.084
Total Risk Across All Media and All Exposure Routes						7.95E-06							

Total CNS HI = 0.021
Total Skin HI = 0.026

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-198
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	7.58E-08	--	NA	7.58E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	8.04E-07	--	NA	8.04E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	9.41E-08	--	NA	9.41E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	7.35E-09	--	NA	7.35E-09	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	8.72E-10	--	NA	8.72E-10	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	5.97E-08	--	NA	5.97E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	6.89E-08	--	NA	6.89E-08	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	7.55E-08	--	7.71E-09	8.32E-08	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.009	--	0.001	0.009
			Arsenic	2.64E-07	--	1.90E-07	4.54E-07	Arsenic	skin	0.005	--	0.003	0.008
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.004	--	0.002	0.006
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.003	--	0.002	0.005
			(Total)	1.45E-06		1.97E-07	1.65E-06	(Total)		0.020		0.008	0.028
Total Risk Across Soil						1.65E-06	Total Hazard Index Across All Media and All Exposure Routes						0.028
Total Risk Across All Media and All Exposure Routes						1.65E-06							

NA - Not Applicable

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

Total CNS HI = 0.009

Total Skin HI = 0.008

TABLE D7-20A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	1.45E-08	--	NA	1.45E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	0
			Benzo(a)pyrene	1.45E-07	--	NA	1.45E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	0
			Benzo(b)fluoranthene	1.61E-08	--	NA	1.61E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	0
			Benzo(k)fluoranthene	1.30E-09	--	NA	1.30E-09	Benzo(k)fluoranthene	carcinogen	NA	--	NA	0
			Chrysene	1.61E-10	--	NA	1.61E-10	Chrysene	carcinogen	NA	--	NA	0
			Dibenzo(a,h)anthracene	1.53E-08	--	NA	1.53E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	0
			Indeno(1,2,3-cd)pyrene	1.22E-08	--	NA	1.22E-08	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	0
			Aroclor-1260	1.26E-08	--	1.93E-08	3.19E-08	Aroclor-1260	carcinogen	NA	--	NA	0
			Aluminum	NA	--	NA	0.00E+00	Aluminum	CNS	0.001	--	0.001	0.002
			Arsenic	5.50E-08	--	5.93E-07	6.48E-07	Arsenic	skin	0.000	--	0.004	0.004
			Chromium	NA	--	NA	0.00E+00	Chromium	NOEL	0.000	--	0.003	0.003
			Vanadium	NA	--	NA	0.00E+00	Vanadium	NOEL	0.0002	--	0.002	0.003
			(Total)	2.73E-07		6.12E-07	8.85E-07	(Total)		0.002		0.010	0.012
Total Risk Across Soil							8.85E-07	Total Hazard Index Across All Media and All Exposure Routes					0.012
Total Risk Across All Media and All Exposure Routes							8.85E-07						

Total CNS HI = 0.002

Total Skin HI = 0.004

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-21
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	1.12E-08	--	NA	1.12E-08	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	1.12E-07	--	NA	1.12E-07	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	1.23E-08	--	NA	1.23E-08	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	9.99E-10	--	NA	9.99E-10	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	1.23E-10	--	NA	1.23E-10	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	1.18E-08	--	NA	1.18E-08	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	9.40E-09	--	NA	9.40E-09	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	9.66E-09	--	1.28E-09	1.09E-08	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.016	--	0.002	0.018
			Arsenic	4.23E-08	--	3.95E-08	8.18E-08	Arsenic	skin	0.007	--	0.006	0.013
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.007	--	0.004	0.012
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.003	--	0.004	0.007
			(Total)	2.09E-07		4.08E-08	2.50E-07	(Total)		0.034		0.017	0.050
Soil	Subsurface Soil	Site 6	none				none						
			(Total)	NA		NA	NA	(Total)		NA		NA	NA
Total Risk Across Surface Soil							2.50E-07	Total Hazard Index Across All Media and All Exposure Routes					0.050
Total Risk Across Subsurface Soil							NA						
Total Risk Across All Media and All Exposure Routes							2.50E-07						

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

Total CNS HI = 0.018
Total Skin HI = 0.013

TABLE D7-22A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	2.17E-06	--	NA	2.17E-06	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	2.17E-05	--	NA	2.17E-05	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	2.40E-06	--	NA	2.40E-06	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	1.94E-07	--	NA	1.94E-07	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	2.40E-08	--	NA	2.40E-08	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	2.29E-06	--	NA	2.29E-06	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	1.83E-06	--	NA	1.83E-06	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	1.88E-06	--	5.03E-07	2.38E-06	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.040	--	0.023	0.063
			Arsenic	8.22E-06	--	1.55E-05	2.37E-05	Arsenic	skin	0.016	--	0.072	0.088
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.018	--	0.052	0.069
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.008	--	0.048	0.056
			(Total)	4.07E-05		1.60E-05	5.67E-05	(Total)		0.082		0.195	0.277
Total Risk Across Soil						5.67E-05	Total Hazard Index Across All Media and All Exposure Routes						0.277
Total Risk Across All Media and All Exposure Routes						5.67E-05							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total CNS HI = 0.063

Total Skin HI = 0.088

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-22B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	2.30E-07	--	NA	2.30E-07	Benzo(a)anthracene	carcinogen	NA	--	NA	NA
			Benzo(a)pyrene	2.30E-06	--	NA	2.30E-06	Benzo(a)pyrene	carcinogen	NA	--	NA	NA
			Benzo(b)fluoranthene	2.60E-07	--	NA	2.60E-07	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA
			Benzo(k)fluoranthene	2.10E-08	--	NA	2.10E-08	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA
			Chrysene	2.60E-09	--	NA	2.60E-09	Chrysene	carcinogen	NA	--	NA	NA
			Dibenzo(a,h)anthracene	2.50E-07	--	NA	2.50E-07	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA
			Indeno(1,2,3-cd)pyrene	2.00E-07	--	NA	2.00E-07	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA
			Aroclor-1260	2.00E-07	--	2.80E-08	2.28E-07	Aroclor-1260	carcinogen	NA	--	NA	NA
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.013	--	0.003	0.016
			Arsenic	8.60E-07	--	8.60E-07	1.76E-06	Arsenic	skin	0.005	--	0.008	0.014
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.006	--	0.006	0.012
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.003	--	0.006	0.008
			(Total)	4.34E-06		9.08E-07	5.25E-06	(Total)		0.027		0.023	0.050
Total Risk Across Soil						5.25E-06	Total Hazard Index Across All Media and All Exposure Routes						0.050
Total Risk Across All Media and All Exposure Routes						5.25E-06							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total CNS HI = 0.016

Total Skin HI = 0.014

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-23A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 6	Benzo(a)anthracene	NA	--	NA	NA	Benzo(a)anthracene	carcinogen	NA	--	NA	NA	
			Benzo(a)pyrene	NA	--	NA	NA	Benzo(a)pyrene	carcinogen	NA	--	NA	NA	
			Benzo(b)fluoranthene	NA	--	NA	NA	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA	
			Benzo(k)fluoranthene	NA	--	NA	NA	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA	
			Chrysene	NA	--	NA	NA	Chrysene	carcinogen	NA	--	NA	NA	
			Dibenzo(a,h)anthracene	NA	--	NA	NA	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA	
			Indeno(1,2,3-cd)pyrene	NA	--	NA	NA	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA	
			Aroclor-1260	NA	--	NA	NA	Aroclor-1260	carcinogen	NA	--	NA	NA	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.372	--	0.036	0.408	
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.149	--	0.111	0.261	
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.166	--	0.080	0.246	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.077	--	0.074	0.151	
			(Total)	NA		NA	NA	(Total)		0.765		0.300	1.065	
Total Risk Across Soil							NA		Total Hazard Index Across All Media and All Exposure Routes					1.065
Total Risk Across All Media and All Exposure Routes							NA							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total CNS HI = 0.408

Total skin HI = 0.261

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-23B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 6
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 6	Benzo(a)anthracene	NA	--	NA	NA	Benzo(a)anthracene	carcinogen	NA	--	NA	NA	
			Benzo(a)pyrene	NA	--	NA	NA	Benzo(a)pyrene	carcinogen	NA	--	NA	NA	
			Benzo(b)fluoranthene	NA	--	NA	NA	Benzo(b)fluoranthene	carcinogen	NA	--	NA	NA	
			Benzo(k)fluoranthene	NA	--	NA	NA	Benzo(k)fluoranthene	carcinogen	NA	--	NA	NA	
			Chrysene	NA	--	NA	NA	Chrysene	carcinogen	NA	--	NA	NA	
			Dibenzo(a,h)anthracene	NA	--	NA	NA	Dibenzo(a,h)anthracene	carcinogen	NA	--	NA	NA	
			Indeno(1,2,3-cd)pyrene	NA	--	NA	NA	Indeno(1,2,3-cd)pyrene	carcinogen	NA	--	NA	NA	
			Aroclor-1260	NA	--	NA	NA	Aroclor-1260	carcinogen	NA	--	NA	NA	
			Aluminum	NA	--	NA	NA	Aluminum	CNS	0.120	--	0.012	0.132	
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.050	--	0.039	0.089	
			Chromium	NA	--	NA	NA	Chromium	NOEL	0.056	--	0.028	0.084	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.026	--	0.026	0.052	
			(Total)	NA		NA	NA	(Total)		0.252		0.105	0.357	
Total Risk Across Soil							NA		Total Hazard Index Across All Media and All Exposure Routes					0.357
Total Risk Across All Media and All Exposure Routes							NA							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total CNS HI = 0.132
Total skin HI = 0.089

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-25
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 30
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil Grass Area	Site 30	Aluminum	NA	--	NA	NA	Aluminum	CNS	0.023	--	0.003	0.026
			Arsenic	5.80E-08	--	5.42E-08	1.12E-07	Arsenic	skin	0.009	--	0.008	0.017
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.005	--	0.006	0.011
			Chromium	NA	--	NA	NA	Chromium	kidney	0.004	--	0.002	0.006
			(Total)	5.80E-08	--	5.42E-08	1.12E-07	(Total)		0.041	--	0.019	0.060
Soil	Subsurface Soil	Site 30	Arsenic	7.13E-08	--	6.7E-08	1.38E-07	Arsenic	skin	0.011	--	0.010	0.021
			(Total)	7.13E-08	--	6.7E-08	1.38E-07	(Total)		0.011	--	0.010	0.021
Total Risk Across Surface Soil							1.12E-07	Total Hazard Index Across All Media and All Exposure Routes					0.081
Total Risk Across Subsurface Soil							1.38E-07						
Total Risk Across All Media and All Exposure Routes							2.50E-07						

Total CNS HI = 0.026
Total Skin HI = 0.038
Total Kidney HI = 0.006

NA - Not Applicable
CNS - Central Nervous System
NOEL - No Observable Effect Level
HI - Hazard Index

TABLE D7-26A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 30
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil Grass Area	Site 30	Aluminum	NA	—	NA	NA	Aluminum	CNS	0.057	--	0.033	0.090
			Arsenic	1.13E-05	—	2.12E-05	3.25E-05	Arsenic	skin	0.022	—	0.099	0.121
			Vanadium	NA	—	NA	NA	Vanadium	NOEL	0.012	—	0.072	0.085
			Chromium	NA	—	NA	NA	Chromium	kidney	0.008	--	0.024	0.033
			(Total)	1.13E-05		2.12E-05	3.25E-05	(Total)		0.100		0.229	0.329
Total Risk Across Soil						3.25E-05	Total Hazard Index Across All Media and All Exposure Routes						0.329
Total Risk Across All Media and All Exposure Routes						3.25E-05							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total CNS HI =	0.090
Total Skin HI =	0.121
Total Kidney HI =	0.033

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-26B
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 30
CENTRAL TENDENCY EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 30	Aluminum	NA	--	NA	NA	Aluminum	CNS	0.011	--	0.002	0.013		
			Arsenic	9.82E-07	--	9.73E-07	2.0E-06	Arsenic	skin	0.006	--	0.009	0.015		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.003	--	0.006	0.009		
			Chromium	NA	--	NA	NA	Chromium	kidney	0.002	--	0.002	0.004		
			(Total)	9.82E-07		9.73E-07	2.0E-06	(Total)		0.022		0.019	0.041		
Total Risk Across Soil							1.96E-06		Total Hazard Index Across All Media and All Exposure Routes					0.041	
Total Risk Across All Media and All Exposure Routes							1.96E-06								

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

Total CNS HI = 0.013
Total Skin HI = 0.015
Total Kidney HI = 0.004

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-27A
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 30
REASONABLE MAXIMUM EXPOSURE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil Grass Area	Site 30	Aluminum	NA	--	NA	NA	Aluminum	CNS	0.532	--	0.051	0.583	
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.205	--	0.153	0.357	
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.116	--	0.111	0.228	
			Chromium	NA	--	NA	NA	Chromium	kidney	0.079	--	0.038	0.116	
			(Total)	NA		NA	NA	(Total)		0.931		0.353	1.284	
Total Risk Across Soil							NA		Total Hazard Index Across All Media and All Exposure Routes					1.284
Total Risk Across All Media and All Exposure Routes							NA							

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total CNS HI = 0.583

Total Skin HI = 0.357

Total Kidney HI = 0.116

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-27B
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 30
 CENTRAL TENDENCY EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	Site 30	Aluminum	NA	--	NA	NA	Aluminum	CNS	0.102	--	0.010	0.112		
			Arsenic	NA	--	NA	NA	Arsenic	skin	0.056	--	0.043	0.099		
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	0.028	--	0.028	0.056		
			Chromium	NA	--	NA	NA	Chromium	kidney	0.018	--	0.009	0.027		
			(Total)	NA		NA	NA	(Total)		0.204		0.090	0.294		
Total Risk Across Soil							NA		Total Hazard Index Across All Media and All Exposure Routes					0.294	
Total Risk Across All Media and All Exposure Routes							NA								

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk (refer to the adult resident for this presentation).

Total CNS HI =	0.112
Total Skin HI =	0.099
Total Kidney HI =	0.027

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-29
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 32
 REASONABLE MAXIMUM EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Construction Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (1)	Site 32	Aluminum	NA	--	NA	NA	Aluminum		NA	--	NA	NA
			Vanadium	NA	--	NA	NA	Arsenic		NA	--	NA	NA
			(Total)	NA		NA	NA	(Total)		NA	--	NA	NA
Soil	Subsurface Soil (2)	Site 32	none	--	--	--	--	none		--	--	--	--
			(Total)	--	--	--	--	(Total)		--	--	--	--
Total Risk Across Surface Soil							NA	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across Subsurface Soil							NA						
Total Risk Across All Media and All Exposure Routes							NA						

Total CNS HI = NA

(1) Concrete covers 8 to 10 inches of Site 32. There is not a complete pathway for surface soil, currently. If the concrete were removed it would be replaced with clean fill.

(2) No COPCs were identified for Site 32 subsurface soil.

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

TABLE D7-30
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs AT SITE 33
 REASONABLE MAXIMUM EXPOSURE
 REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Construction Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil (1)	Site 33	Aluminum	NA	--	NA	NA	Aluminum	CNS	NA	--	NA	NA
			Vanadium	NA	--	NA	NA	Vanadium	NOEL	NA	--	NA	NA
			(Total)	NA		NA	NA	(Total)	NA	--	NA	NA	
Soil	Subsurface Soil	Site 33	Arsenic	8.82E-08	--	8.25E-08	1.71E-07	Arsenic	skin	0.014	--	0.013	0.027
			(Total)	8.82E-08		8.25E-08	1.71E-07	(Total)	0.014		0.013	0.027	
Total Risk Across Surface Soil							NA	Total Hazard Index Across All Media and All Exposure Routes					0.027
Total Risk Across Subsurface Soil							1.71E-07						
Total Risk Across All Media and All Exposure Routes							1.71E-07						

(1) Concrete which is eight to ten inches thick covers the surface soil currently. Therefore, there is no complete pathway. In the future, the concrete would be replaced by clean fill.

Total Skin HI = 0.027

NA - Not Applicable

CNS - Central Nervous System

NOEL - No Observable Effect Level

HI - Hazard Index

APPENDIX D8
RISK ASSESSMENT SUMMARY

TABLE D8-1

RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE

SITE 3

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Arsenic	3.23E-07	—	1.15E-06	1.47E-06	(Total)					
			(Total)	3.23E-07		1.15E-06	1.47E-06						
Total Risk Across Soil							1.47E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.47E-06						

Total Liver HI = NA
 Total Skin HI = NA
 Total CNS HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-2
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
SITE 3
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Arsenic (Total)	4.15E-07	--	1.86E-06	2.28E-06	(Total)					
				4.15E-07	--	1.86E-06	2.28E-06						
Total Risk Across Soil							2.28E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							2.28E-06						

Total Liver HI = NA
 Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-3

SITE 3

REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32, AND 33

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Occupational Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Arsenic	1.44E-06	--	5.18E-06	6.62E-06	(Total)					
			(Total)	1.44E-06	--	5.18E-06	6.62E-06						
Total Risk Across Soil							6.62E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							6.62E-06						

Total Liver HI = NA
 Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

D8-3

TABLE D8-4
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE

SITE 3

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (Adult/Child)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Dieldrin	1.10E-06	--	5.30E-07	1.63E-06	(Total)					
			Arsenic	1.29E-05	--	2.48E-05	3.77E-05						
			(Total)	1.40E-05	--	2.53E-05	3.93E-05						
			Total Risk Across Soil				3.93E-05						
Total Risk Across All Media				3.93E-05	Total Hazard Index Across All Media and All Exposure Routes					NA			

Total Liver HI = NA
Total CNS HI = NA
Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-5
RISK ASSESSMENT SUMMARY - CENTRAL TENDENCY EXPOSURE

SITE 3

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 3	Arsenic	5.90E-07	—	5.80E-07	1.17E-06	Arsenic	skin	—	—	—	—
			(Total)	5.90E-07		5.80E-07	1.17E-06	(Total)		—		—	—
Total Risk Across Soil							1.17E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.17E-06						

Total Liver HI =	NA
Total CNS HI =	NA
Total Skin HI =	NA

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-6
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
SITE 4
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Older Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Arsenic	2.23E-07	—	7.94E-07	1.02E-06	(Total)					
			(Total)	2.23E-07	—	7.94E-07	1.02E-06						
Total Risk Across Soil							1.02E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.02E-06						

Total Liver HI = NA
 Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index
 CNS - Central nervous system
 NA - not applicable

TABLE D8-7
 RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
 SITE 4
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Arsenic	2.87E-07	—	1.29E-06	1.57E-06	(Total)					
			(Total)	2.87E-07		1.29E-06	1.57E-06						
Total Risk Across Soil							1.57E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.57E-06						

Total Liver HI = NA
 Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-8
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE

SITE 4

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future Receptor Population: Occupational Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	Site 4	Arsenic (Total)	9.96E-07	--	3.58E-06	4.57E-06	(Total)						
				9.96E-07		3.58E-06	4.57E-06							
Total Risk Across Soil							4.57E-06	Total Hazard Index Across All Media and All Exposure Routes						NA
Total Risk Across All Media and All Exposure Routes							4.57E-06							

Total Liver HI =	NA
Total CNS HI =	NA
Total Skin HI =	NA

HI - Hazard Index
 CNS - Central nervous system
 NA - not applicable

D8-8

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D8-9

TABLE D8-9

RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE

SITE 4

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (Adult/Child)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Dieldrin	2.14E-06	~	1.03E-06	3.17E-06	(Total)					
			Arsenic	8.90E-06	~	1.67E-05	2.56E-05						
			(Total)	1.10E-05		1.77E-05	2.88E-05						
Total Risk Across Soil							2.88E-05	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							2.88E-05						

Total Liver HI = NA
 Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

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TABLE D8-10
RISK ASSESSMENT SUMMARY - CENTRAL TENDENCY EXPOSURE

SITE 4

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 4	Arsenic (Total)	9.80E-07	--	9.50E-07	1.91E-06	Arsenic (Total)	skin	--	--	--	--
				9.80E-07		9.50E-07	1.91E-06			--		--	--
Total Risk Across Soil							1.91E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.91E-06						

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable

Total Liver HI = NA
Total CNS HI = NA
Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-11
 RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
 SITE 6
 NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Trespasser
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Arsenic	2.64E-07	—	1.19E-06	1.45E-06	(Total)					
			(Total)	2.64E-07		1.19E-06	1.45E-06						
Total Risk Across Soil							1.45E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.45E-06						

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

Total CNS HI = NA
 Total Skin HI = NA

TABLE D8-12
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Occupational Worker
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)pyrene	2.42E-06	--	NA	2.42E-06	(Total)					
			Arsenic	9.17E-07	--	3.29E-06	4.21E-06						
			(Total)	3.34E-06		3.29E-06	6.63E-06						
Total Risk Across Soil							6.63E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							6.63E-06						

Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index
 CNS - Central nervous system
 NA - not applicable

TABLE D8-13
RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE
SITE 6
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (Adult/Child)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)anthracene	2.17E-06	--	NA	2.17E-06	(Total)					
			Benzo(a)pyrene	2.17E-05	--	NA	2.17E-05						
			Benzo(b)fluoranthene	2.40E-06	--	NA	2.40E-06						
			Dibenzo(a,h)anthracene	2.29E-06	--	NA	2.29E-06						
			Indeno(1,2,3-cd)pyrene	1.83E-06	--	NA	1.83E-06						
			Aroclor-1260	1.88E-06	--	5.03E-07	2.38E-06						
			Arsenic	8.22E-06	--	1.55E-05	2.37E-05						
			Total	4.05E-05		1.60E-05	5.65E-05						
Total Risk Across Soil							5.65E-05	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							5.65E-05						

Total CNS HI = NA

Total Skin HI = NA

HI - Hazard Index
CNS - Central nervous system
NA - not applicable

TABLE D8-14
RISK ASSESSMENT SUMMARY - CENTRAL TENDENCY EXPOSURE

SITE 6

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 6	Benzo(a)pyrene	2.30E-06	--	NA	2.30E-06	Benzo(a)pyrene	carcinogen	--	--	--	--
			Arsenic	8.80E-07	--	8.80E-07	1.76E-06	Arsenic	skin	--	--	--	--
			(Total)	3.18E-06		8.80E-07	4.06E-06	(Total)		--		--	--
Total Risk Across Soil							4.06E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							4.06E-06						

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

Total CNS HI = NA

Total Skin HI = NA

TABLE D8-15

RISK ASSESSMENT SUMMARY - REASONABLE MAXIMUM EXPOSURE

SITE 30

NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (Adult/Child)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 30	Arsenic	1.13E-05	--	2.12E-05	3.25E-05	(Total)					
			(Total)	1.13E-05	--	2.12E-05	3.25E-05						
Total Risk Across Soil							3.25E-05	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							3.25E-05						

Total CNS HI = NA
 Total Skin HI = NA

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

TABLE D8-16
RISK ASSESSMENT SUMMARY - CENTRAL TENDENCY EXPOSURE
SITE 30
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk (1)				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Site 30	Arsenic	9.82E-07	—	9.73E-07	1.96E-06	(Total)					
			(Total)	9.82E-07		9.73E-07	1.96E-06						
Total Risk Across Soil							1.96E-06	Total Hazard Index Across All Media and All Exposure Routes					NA
Total Risk Across All Media and All Exposure Routes							1.96E-06						

(1) Cancer risk is calculated using an age adjustment and is presented as lifetime cancer risk.

NA - Not Applicable

HI - Hazard Index

CNS - Central nervous system

NA - not applicable

Total CNS HI = NA

Total Skin HI = NA

APPENDIX D9

**HYPOTHETICAL FUTURE CONDITIONS ASSUMING CONCRETE REMOVAL
SITES 30, 32, AND 33**

TABLE D9-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 30 SURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 2

Scenario Time Frame: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil (0'-4')
Exposure Point: Site 30

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Sample Maximum	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Screening Value ⁽¹⁾	Screening Toxicity Value			COPC Flag	Rationale for Contaminant Deletion or Selection ^(1a)
												Region III ⁽²⁾	Florida ⁽³⁾	Soil ⁽¹¹⁾		
												Residential	Soil ⁽¹¹⁾	Residential		
Volatiles																
540-59-0	1,2-Dichloroethene (total)	0.16		0.16		mg/kg	30B00301	1/15	0.006 - 1.5	0.16	NA	70	N	19 ⁽⁸⁾	N	BSL
78-93-3	2-Butanone	0.028		0.028		mg/kg	30B00101	1/13	0.011 - 1.5	0.028	NA	4700	N	3100	N	BSL
67-64-1	Acetone	0.004	J	0.06		mg/kg	30SB6-0-2(93)	3/15	0.006 - 1.5	0.06	NA	780	N	780	N	BSL
75-09-2	Methylene Chloride	0.004	J	0.015	J	mg/kg	30B00301	2/15	0.011 - 1.5	0.015	NA	85	C	16	N	BSL
108-88-3	Toluene	0.009	J	0.009	J	mg/kg	30B00301	1/15	0.006 - 1.5	0.009	NA	1600	N	380	N	BSL
79-01-6	Trichloroethene	0.005	J	0.18	J	mg/kg	30SB02-0-2(93)	4/15	0.006 - 1.5	0.18	NA	58	C	8	N	BSL
1330-20-7	Xylenes, Total	0.025	J	0.025	J	mg/kg	30B00301	1/15	0.006 - 1.5	0.025	NA	1600	N	5900	N	BSL
Semivolatiles																
91-57-6	2-Methylnaphthalene	0.069	J	4.7		mg/kg	30SB02-0-2(93)	4/15	0.35 - 2	4.7	NA	160	N	83	N	BSL
191-24-2	Benzo(g,h,i)perylene	0.092	J	0.092	J	mg/kg	30SB1-2-4(92)-D	1/15	0.35 - 2	0.092	NA	NA	NA	2300	N	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.046	J	0.16	J	mg/kg	30SB02-0-2(93)	4/15	0.35 - 2	0.16	NA	46	C	76	N	BSL
132-64-9	Dibenzofuran	0.22	J	0.22	J	mg/kg	30B00301	1/15	0.35 - 2	0.22	NA	31	N	280	N	BSL
86-73-7	Fluorene	0.48	J	0.48	J	mg/kg	30SB02-0-2(93)	1/15	0.35 - 2	0.48	NA	310	N	2200	N	BSL
91-20-3	Naphthalene	0.14	J	8.6		mg/kg	30B00301	3/15	0.35 - 2	8.6	NA	160	N	40	N	BSL
87-86-5	Pentachlorophenol	0.062	J	0.062	J	mg/kg	30B00501	1/15	0.37 - 5	0.062	NA	5.3	C	7.7	N	BSL
85-01-8	Phenanthrene	0.12	J	0.3	J	mg/kg	30B00301	2/15	0.35 - 2	0.3	NA	160 ⁽⁸⁾	N	2000	N	BSL
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.0026	J	0.0026	J	mg/kg	30SB02-0-2(93)	1/9	0.0037 - 0.0041	0.0026	NA	2.7	C	4.6	N	BSL
60-57-1	Dieldrin	0.0019	J	0.013	J	mg/kg	30SB03-0-2(93)	3/9	0.0037 - 0.0041	0.013	NA	0.04	C	0.07	N	BSL
5103-71-9	Gamma-Chlordane	0.0004	J	0.0004	J	mg/kg	W30SB00901	1/9	0.0019 - 0.0021	0.0004	NA	1.6 ⁽⁴⁾	C	3.1 ⁽⁴⁾	N	BSL
Inorganics																
7429-90-5	Aluminum	8190		41600		mg/kg	W30SB01301	9/9	NA	41600	15848	7800	N	72000	Y	ASL
7440-38-2	Arsenic	1.5	J	5.2		mg/kg	30SB04-0-2(93)	9/9	NA	5.2	3.2	0.43	C	0.8	Y	ASL
7440-39-3	Barium	10	J	26.1	J	mg/kg	30SB7-0-2(93)	9/9	NA	26.1	23.2	550	N	110	N	BSL
7440-41-7	Beryllium	0.08	J	0.14	J	mg/kg	30SB6-0-2(93)	5/9	0.06 - 0.32	0.14	0.36	0.15	C	120	N	BSL
7440-43-9	Cadmium	0.5	J	0.95		mg/kg	30SB04-0-2(93)	2/9	0.28 - 0.91	0.95	0.58	3.9	N	75	N	BSL
7440-70-2	Calcium	137	J	1850		mg/kg	30SB5-0-2(93)	9/9	NA	1850	396	NA	NA	NA	N	NUT
7440-47-3	Chromium	8.4		30.7		mg/kg	W30SB01301	9/9	NA	30.7	11	23 ⁽⁵⁾	N	210 ⁽⁵⁾	Y	ASL
7440-48-4	Cobalt	0.56		4.4	J	mg/kg	30SB6-0-2(93)	7/9	0.47 - 1.4	4.4	3	470	N	4700	N	BSL
7440-50-8	Copper	1.1	J	8.4		mg/kg	W30SB01301	9/9	NA	8.4	9.4	310	N	110	N	BSL
57-12-5	Cyanide	0.44	J	0.6	J	mg/kg	30SB7-0-2(93)	6/7	0.17 - 0.19	0.6	0.28	160	N	30	N	BSL
7439-89-6	Iron	7870		24100		mg/kg	W30SB01301	9/9	NA	24100	8832	2300	N	23000	Y	ASL
7439-92-1	Lead	4.5	J	66		mg/kg	30SB04-0-2(93)	15/15	NA	66	11.4	400 ⁽⁶⁾	NA	400	N	BSL
7439-95-4	Magnesium	61.2	J	237	J	mg/kg	30SB03-0-2(93)	8/9	147	237	268	NA	NA	NA	N	NUT, BBV
7439-96-5	Manganese	15.9		898		mg/kg	30SB7-0-2(93)	9/9	NA	898	392	160	N	1600	N	ASL
7439-97-6	Mercury	0.02	J	0.06		mg/kg	30SB5-0-2(93)	7/9	0.02 - 0.03	0.06	0.12	2.3 ⁽⁷⁾	N	3.4	N	BSL
7440-02-0	Nickel	2.1		3.3	J	mg/kg	30SB7-0-2(93)	5/9	1.9 - 3	3.3	7.2	160	N	110	N	BSL
7440-09-7	Potassium	82.2		215	J	mg/kg	30SB1-2-4(92)-D	6/8	117 - 177	215	177	NA	NA	NA	N	NUT
7782-49-2	Selenium	0.15	J	2.1		mg/kg	30SB02-0-2(93)	6/9	0.47 - 0.53	2.1	0.46	39	N	390	N	BSL
7782-49-2	Selenium	0.15	J	2.1		mg/kg	30SB04-0-2(93)	6/9	0.47 - 0.53	2.1	0.46	39	N	390	N	BSL
7440-22-4	Silver	0.52		0.9	J	mg/kg	30SB02-0-2(93)	4/9	0.28 - 0.56	0.9	0.7	39	N	390	N	BSL
7440-23-5	Sodium	13.7	J	201	J	mg/kg	30SB1-2-4(92)	3/9	12.7 - 52.7	201	406	NA	NA	NA	N	NUT, BBV
7440-62-2	Vanadium	20.3		63.7		mg/kg	W30SB01301	9/9	NA	63.7	21.8	55	N	15	Y	ASL
7440-66-6	Zinc	1.6	J	8.8		mg/kg	W30SB00901	9/9	NA	8.8	15.4	2300	N	23000	N	BSL
NA	TPH (EPA SW418.1)	2.7		9610		mg/kg	30SB02-0-2(93)	10/13	1.9 - 26.0	9610	NA	NA	NA	340	Y	ASL
NA	TPH (C8-C40)	55.8		55.8		mg/kg	W30SB01301	1/2	9.8	55.8	NA	NA	NA	340	N	BSL

TABLE D9-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 30 SURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
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Notes:

- (1) Table 3-18, General Information Report (GIR), Remedial Investigation and Feasibility Study, ABB, January, 1998. Background screening value for inorganics is two times the mean detected concentration.
 (2) Region III Risk-Based Concentration Table, Oct. 1, 1998. (note: 1/10th RBC value used for noncarcinogens).
 (3) Table 1, Soil Cleanup Target Levels, Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., January 21, 1999.
 (4) Value is for chlordane.
 (5) Value is for hexavalent chromium.
 (6) Screening level for lead, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities", OSWER Directive #9355.4-12.
 (7) Value is for mercuric chloride.
 (8) Value is for naphthalene.
 (9) Value is for cis-1,2-dichloroethene.
 (10) Rationale codes: Selection or Deletion Reason:

Above Screening Level (ASL)
 Essential Nutrient (NUT)
 Below Screening Level (BSL)
 Below Background Value (BBV)
 C - carcinogen

(11) Soil basis codes: N - noncarcinogen

Associated Samples:

30B00101	30B00501	30SB04-0-2(93)	30SB5-0-2(93)
30B00201	30B00601	30SB1-2-4(92)	30SB6-0-2(93)
30B00301	30SB02-0-2(93)	30SB1-2-4(92)-AVG	30SB7-0-2(93)
30B00401	30SB03-0-2(93)	30SB1-2-4(92)-D	W30SB00901
			W30SB01301

Chemicals are bolded which exceed criteria.

The average of a sample and its duplicate is used for all calculations.

COPC - Chemical of Potential Concern

J - estimated value

mg/kg - milligram per kilogram

NA - not available

TABLE D9-2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 32 SURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
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Scenario Time Frame: Future
Medium: Surface Soil
Exposure Medium: Surface Soil (0'-2')
Exposure Point: Site 32

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Sample Maximum	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Screening Value ⁽¹⁾	Screening Toxicity Value			COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁴⁾
												Region III ⁽²⁾		Florida ⁽³⁾		
												Soil Residential	Soil ⁽⁵⁾ Basis	Soil Residential		
Volatiles																
67-64-1	Acetone	0.003	J	0.2		mg/kg	32SB3-0-2(93)	4/7	0.011 - 1.4	0.2	NA	780	N	780	N	BSL
79-01-6	Trichloroethene	0.001	J	0.002	J	mg/kg	32SB1-1-2(93)	2/7	0.011 - 1.4	0.002	NA	58	C	6	N	BSL
1330-20-7	Xylenes, Total	0.011	J	0.011	J	mg/kg	32SB3-0-2(93)	1/7	0.011 - 1.4	0.011	NA	16000	N	5900	N	BSL
Semivolatiles																
105-67-9	2,4-Dimethylphenol	1.5	J	1.5	J	mg/kg	32SB6-0-2(93)	1/7	0.35 - 0.39	1.5	NA	160	N	910	N	BSL
91-57-6	2-Methylnaphthalene	0.62		15		mg/kg	32SB6-0-2(93)	2/7	0.35 - 0.39	15	NA	160	N	83	N	BSL
83-32-9	Acenaphthene	1.4	J	1.4	J	mg/kg	32SB6-0-2(93)	1/7	0.35 - 0.39	1.4	NA	470	N	1900	N	BSL
206-44-0	Fluoranthene	0.053	J	0.053	J	mg/kg	32SB3-0-2(93)	1/7	0.35 - 7.3	0.053	NA	310	N	2900	N	BSL
86-73-7	Fluorene	2.6	J	2.6	J	mg/kg	32SB6-0-2(93)	1/7	0.35 - 0.39	2.6	NA	310	N	2200	N	BSL
86-30-6	N-Nitrosodiphenylamine	1.6	J	1.6	J	mg/kg	32SB6-0-2(93)	1/7	0.35 - 0.39	1.6	NA	130	C	170	N	BSL
91-20-3	Naphthalene	1.4		2.5	J	mg/kg	32SB6-0-2(93)	2/7	0.35 - 0.39	2.5	NA	160	N	40	N	BSL
85-01-8	Phenanthrene	0.063	J	5.1	J	mg/kg	32SB6-0-2(93)	2/7	0.35 - 0.39	5.1	NA	160 ⁽⁴⁾	NA	2000	N	BSL
129-00-0	Pyrene	0.036	J	1.2	J	mg/kg	32SB6-0-2(93)	2/7	0.35 - 0.39	1.2	NA	230	N	2200	N	BSL
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.0022	J	0.0022	J	mg/kg	32SB7-0-2(93)	1/7	0.0035 - 0.0039	0.0022	NA	2.7	C	4.6	N	BSL
72-55-9	4,4'-DDE	0.0007	J	0.0007	J	mg/kg	32SB7-0-2(93)	1/7	0.0035 - 0.0039	0.0007	NA	1.9	C	3.3	N	BSL
11097-69-1	Aroclor-1254	0.16	J	0.16	J	mg/kg	32SB6-0-2(93)	1/7	0.035 - 0.039	0.16	NA	0.32	C	0.5 ⁽⁵⁾	N	BSL
Inorganics																
7429-90-5	Aluminum	5740		21900		mg/kg	32SB2-0-2(93)	7/7	NA	21900	15848	7800	N	72000	Y	ASL
7440-38-0	Antimony	6	J	6	J	mg/kg	32SB2-0-2(93)	1/7	2.6 - 5.5	6	6	3.1	N	.26	Y	ASL
7440-38-2	Arsenic	0.46	J	2.8		mg/kg	32SB7-0-2(93)	6/7	0.48	2.8	3.2	0.43	C	0.8	Y	ASL
7440-39-3	Barium	7.6	J	15.9	J	mg/kg	32SB5-1-2(93)	7/7	NA	15.9	23.2	550	N	110	N	BSL
7440-41-7	Beryllium	0.06	J	0.22	J	mg/kg	32SB5-1-2(93)	4/7	0.11	0.22	0.36	16	N	120	N	BSL, BBV
7440-70-2	Calcium	257	J	931	J	mg/kg	32SB3-0-2(93)-D	7/7	NA	931	396	NA	NA	NA	N	NUT
7440-47-3	Chromium	4.9		22.5		mg/kg	32SB1-1-2(93)	7/7	NA	22.5	11	23 ⁽⁶⁾	N	210 ⁽⁶⁾	N	BSL
7440-48-4	Cobalt	0.75	J	1.8	J	mg/kg	32SB2-0-2(93)	5/7	1.2 - 1.3	1.8	3	470	N	4700	N	BSL
7440-50-8	Copper	1.6	J	5.7		mg/kg	32SB3-0-2(93)-D	7/7	NA	5.7	9.4	310	N	110	N	BSL
57-12-5	Cyanide	0.46	J	0.58	J	mg/kg	32SB1-1-2(93)	4/7	0.16	0.58	0.28	160	N	30	N	BSL
7439-89-6	Iron	3350		13200		mg/kg	32SB2-0-2(93)	7/7	NA	13200	6832	2300	N	23000	Y	ASL
7439-92-1	Lead	2.5		30.7		mg/kg	32SB7-0-2(93)	7/7	NA	30.7	11.4	400 ⁽⁷⁾	NA	400	N	BSL
7439-95-4	Magnesium	44.4	J	207	J	mg/kg	32SB5-1-2(93)	7/7	NA	207	268	NA	NA	NA	N	NUT
7439-96-5	Manganese	11.2		95.5		mg/kg	32SB5-1-2(93)	7/7	NA	95.5	392	160	N	1600	N	BSL
7439-97-6	Mercury	0.02	J	0.04		mg/kg	32SB3-0-2(93)-D	6/7	0.02	0.04	0.12	2.3 ⁽⁸⁾	N	3.4	N	BSL
7439-97-6	Mercury	0.02	J	0.04		mg/kg	32SB6-0-2(93)	6/7	0.02	0.04	0.12	2.3 ⁽⁸⁾	N	3.4	N	BSL
7439-97-6	Mercury	0.02	J	0.04	J	mg/kg	32SB4-0-2(93)	6/7	0.02	0.04	0.12	2.3 ⁽⁸⁾	N	3.4	N	BSL
7440-02-0	Nickel	2.5	J	4	J	mg/kg	32SB2-0-2(93)	5/7	1.7 - 2.8	4	7.2	160	N	110	N	BSL
7440-02-0	Nickel	2.5	J	4	J	mg/kg	32SB4-0-2(93)	5/7	1.7 - 2.8	4	7.2	160	N	110	N	BSL
7440-09-7	Potassium	119	J	273	J	mg/kg	32SB2-0-2(93)	7/7	NA	273	177	NA	NA	NA	N	NUT
7782-49-2	Selenium	0.22	J	3.7		mg/kg	32SB5-1-2(93)	2/7	0.11 - 0.79	3.7	0.46	39	N	390	N	BSL
7440-22-4	Silver	0.69	J	1.2	J	mg/kg	32SB2-0-2(93)	2/7	0.45 - 0.54	1.2	0.7	39	N	390	N	BSL
7440-23-5	Sodium	13	J	193	J	mg/kg	32SB6-0-2(93)	6/7	12.3	193	406	NA	NA	NA	N	NUT
7440-62-2	Vanadium	8.8	J	36.8		mg/kg	32SB2-0-2(93)	7/7	NA	36.8	21.8	55	N	15	Y	ASL
7440-66-6	Zinc	1.9	J	10.6		mg/kg	32SB7-0-2(93)	7/7	NA	10.6	15.4	2300	N	23000	N	BSL
NA	TPH	27.1		12300		mg/kg	32SB6-0-2(93)	4/7	1.8	12300	NA	NA	NA	340	Y	ASL

Notes.

(1) Table 3-18, General Information Report (GIR), Remedial Investigation and Feasibility Study, ABB, January, 1998. Background screening value for inorganics is two times the mean detected concentration.

(2) Region III Risk-Based Concentration Table, Oct. 1, 1998. (note: 1/10th RBC value used for noncarcinogens)

(3) Table 1, Soil Cleanup Target Levels, Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., January 21, 1999

(4) Value is for naphthalene.

TABLE D9-2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 32 SURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
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(5) Value is for total arsenic.

(6) Value is for hexavalent chromium.

(7) Screening level for lead, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities", OSWER Directive #9355.4-12.

(8) Value is for mercuric chloride.

(9) Rationale codes: Selection or Deletion Reason:

Above Screening Level (ASL)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Below Background Value (BBV)
C - carcinogen

(10) Soil basis codes: N - noncarcinogen

Associated Samples:

32SB1-1-2(93)	32SB3-0-2(93)-AVG	32SB5-1-2(93)
32SB2-0-2(93)	32SB3-0-2(93)-D	32SB6-0-2(93)
32SB3-0-2(93)	32SB4-0-2(93)	32SB7-0-2(93)

The average of a sample and its duplicate is used for all calculations.

COPC - Chemical of Potential Concern

J - estimated value

mg/kg - milligram per kilogram

NA - not available

TABLE D9-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 33 SURFACE AND SUBSURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
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Scenario Time Frame: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil (0'-4')
Exposure Point: Site 33

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Sample Maximum	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Screening Value ⁽¹⁾	Screening Toxicity Value			COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
												Region III ⁽²⁾		Florida ⁽³⁾		
												Soil Residual	Soil ⁽⁴⁾ Basis	Soil Residual		
Volatiles																
71-55-6	1,1,1-Trichloroethane	0.001	J	0.001	J	mg/kg	33B00301	1/8	0.005 - 0.012	0.001	NA	160	N	400	N	BSL
540-59-0	1,2-Dichloroethene (total)	0.002	J	0.002	J	mg/kg	33B00201	2/8	0.005 - 0.012	0.002	NA	70	N	19 ⁽⁴⁾	N	BSL
540-59-0	1,2-Dichloroethene (total)	0.002	J	0.002	J	mg/kg	33B00301	2/8	0.005 - 0.012	0.002	NA	70	N	19 ⁽⁴⁾	N	BSL
78-93-3	2-Butanone	0.004	J	0.004	J	mg/kg	33B00301	1/7	0.011 - 0.012	0.004	NA	4700	N	3100	N	BSL
75-09-2	Methylene Chloride	0.002	J	0.003	J	mg/kg	33B00101	3/8	0.011 - 0.036	0.003	NA	85	C	16	N	BSL
127-18-4	Tetrachloroethene	0.002	J	0.002	J	mg/kg	33B00301	1/8	0.005 - 0.012	0.002	NA	12	C	6.9	N	BSL
79-01-6	Trichloroethene	0.014		0.13		mg/kg	33B00201	4/8	0.005 - 0.011	0.13	NA	58	C	6	N	BSL
1330-20-7	Xylenes, Total	0.011	J	0.011	J	mg/kg	33SB5-0-2(92)-D	1/8	0.005 - 0.012	0.011	NA	16000	N	55900	N	BSL
Semivolatiles																
91-57-6	2-Methylnaphthalene	2		2.5		mg/kg	33SB5-0-2(92)-D	1/8	0.36 - 0.37	2.5	NA	160	N	83	N	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.061	J	0.41	J	mg/kg	33SB4-3-5(92)	2/8	0.36 - 0.39	0.41	NA	46	C	76	N	BSL
86-73-7	Fluorene	0.068	J	0.068	J	mg/kg	33SB5-0-2(92)-D	1/8	0.36 - 0.39	0.068	NA	310	N	2200	N	BSL
91-20-3	Naphthalene	0.27	J	0.35	J	mg/kg	33SB5-0-2(92)-D	1/8	0.36 - 0.37	0.35	NA	160	N	40	N	BSL
Pesticides/PCBs																
72-55-9	4,4'-DDE	0.0002	J	0.0002	J	mg/kg	W33SB00601	1/5	0.0036 - 0.0039	0.0002	NA	1.9	C	3.3	N	BSL
50-29-3	4,4'-DDT	0.0006	J	0.0006	J	mg/kg	W33SB00601	1/5	0.0036 - 0.0039	0.0006	NA	1.9	C	3.3	N	BSL
	Alpha-Chlordane	0.05	J	0.05	J	mg/kg	33SB2-2-4(92)	1/5	0.0018 - 0.002	0.05	NA	1.6 ⁽⁶⁾	C	3.1 ⁽⁵⁾	N	BSL
60-57-1	Dieldrin	0.013	J	0.013	J	mg/kg	33SB2-2-4(92)	1/5	0.0036 - 0.0039	0.013	NA	0.04	C	0.07	N	BSL
5103-71-9	Gamma-Chlordane	0.077	J	0.077	J	mg/kg	33SB2-2-4(92)	1/5	0.0018 - 0.002	0.077	NA	1.6 ⁽⁶⁾	C	3.1 ⁽⁵⁾	N	BSL
76-44-8	Heptachlor	0.0035	J	0.0035	J	mg/kg	33SB2-2-4(92)	1/5	0.0018 - 0.002	0.0035	NA	0.14	C	0.2	N	BSL
Inorganics																
7429-90-5	Aluminum	9590		28400		mg/kg	33SB5-0-2(92)-D	5/5	NA	28400	15848	7800	N	72000	Y	ASL
7440-38-2	Arsenic	0.7	J	11.5		mg/kg	33SB2-2-4(92)	5/5	NA	11.5	3.2	0.43	C	0.8	Y	ASL
7440-39-3	Barium	10.8	J	23.2		mg/kg	W33SB00601	5/5	NA	23.2	23.2	550	N	110	N	BSL
7440-43-9	Cadmium	0.39	J	2.2		mg/kg	W33SB00601	5/5	NA	2.2	0.58	3.9	N	75	N	BSL
7440-70-2	Calcium	296		870	J	mg/kg	33SB5-0-2(92)-D	5/5	NA	870	396	NA	NA	NA	N	NUT
7440-47-3	Chromium	6.9		19		mg/kg	33SB5-0-2(92)-D	5/5	NA	19	11	23	N	210 ⁽⁶⁾	N	BSL
7440-48-4	Cobalt	1.2		1.8	J	mg/kg	33SB4-3-5(92)	4/5	1.3 - 1.4	1.8	3	470	N	4700	N	BSL
7440-50-8	Copper	2.9	J	8		mg/kg	W33SB00601	5/5	NA	8	9.4	310	N	110	N	BSL
7439-89-6	Iron	5880		14400		mg/kg	33SB5-0-2(92)-D	5/5	NA	14400	8832	2300	N	23000	Y	ASL
7439-92-1	Lead	2.7		16.7		mg/kg	33SB2-2-4(92)	8/8	NA	16.7	11.4	400 ⁽⁷⁾	NA	400	N	BSL
7439-95-4	Magnesium	74.2	J	204		mg/kg	W33SB00601	5/5	NA	204	268	NA	NA	NA	N	NUT
7439-95-4	Magnesium	74.2	J	204	J	mg/kg	33SB5-0-2(92)-D	5/5	NA	204	268	NA	NA	NA	N	NUT
7439-96-5	Manganese	41.4		169		mg/kg	33SB4-3-5(92)	5/5	NA	169	392	160	N	1600	N	BBV
7439-97-6	Mercury	0.03	J	0.17		mg/kg	33SB5-0-2(92)	4/5	0.03	0.17	0.12	2.3 ⁽⁸⁾	N	3.4	N	BSL
7440-02-0	Nickel	3.2	J	3.5		mg/kg	W33SB00601	2/5	1.7 - 1.8	3.5	7.2	160	N	110	N	BSL
7440-09-7	Potassium	107	J	197	J	mg/kg	33SB5-0-2(92)-D	4/5	142	197	177	NA	NA	NA	N	NUT
7782-49-2	Selenium	0.22	J	0.48	J	mg/kg	33SB1-3-5(92)	3/5	0.11 - 1.1	0.48	0.46	39	N	390	N	BSL
7440-23-5	Sodium	156	J	239	J	mg/kg	33SB5-0-2(92)	4/5	109	239	406	NA	NA	NA	N	NUT
7440-62-2	Vanadium	14.4		39.6		mg/kg	33SB5-0-2(92)-D	5/5	NA	39.6	21.8	55	N	15	Y	ASL
7440-66-6	Zinc	5.9		21.9	J	mg/kg	W33SB00601	5/5	NA	21.9	15.4	2300	N	23000	N	BSL
NA	TPH (EPA SW418.1)	13.8		2340		mg/kg	33SB5-0-2(92)	4/7	1.8 - 2.0	2340	NA	NA	NA	340	Y	ASL
NA	TPH (C8 - C40)	10.7		10.7		mg/kg	W33SB00601	1/1	NA	10.7	NA	NA	NA	340	N	BSL

Notes:

(1) Table 3-18, General Information Report (GIR), Remedial Investigation and Feasibility Study, ABB, January, 1998. Background screening value for inorganics is two times the mean detected concentration.

(2) Region III Risk-Based Concentration Table, Oct. 1, 1998. (note: 1/10th RBC value used for noncarcinogens).

(3) Table 1, Soil Cleanup Target Levels, Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., January 21, 1999

(4) Value is for cis-1,2-dichloroethene.

(5) Value is for chlordane

(6) Value is for hexavalent chromium

(7) Screening level for lead, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities", OSWER Directive #9355.4-12.

(8) Value is for mercuric chloride.

(9) Rationale codes: Selection or Deletion Reason:

Above Screening Level (ASL)
Essential Nutrient (NUT)

TABLE D9-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FOR SITE 33 SURFACE AND SUBSURFACE SOIL
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 6 OF 2

(10) Soil basis codes:	N - noncarcinogen	Below Screening Level (BSL) Below Background Value (BBV) C - carcinogen
Associated Samples:		
33B00101	33SB1-3-5(92)	33SB5-0-2(92)
33B00201	33SB2-2-4(92)	33SB5-0-2(92)-AVG
33B00301	33SB4-3-5(92)	33SB5-0-2(92)-D W33SB00601
COPC - Chemical of Potential Concern		
J - estimated value		
mg/kg - milligram per kilogram		
NA - not available		

Table D9-4
Statistics: Site 30 Surface Soil without Concrete
NAS Whiting Field, Milton, Florida

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	STANDARD DEVIATION	W NORMAL	W LOGNORMAL	W TEST	SAMPLE UCL - NORMAL	SAMPLE UCL - LOGNORMAL	DETECTS - MAX	Dist'n	Rep Conc RME	Rep Conc CTE	Comment
ALUMINUM	mg/kg	9.0000	9.0000	15960.0000	9974.9323	0.6290	0.7982	0.8290	22144.4580	22612.5636	41600.0000	U	41600.0000	15960.0000	n<10
ARSENIC	mg/kg	9.0000	9.0000	3.7222	1.1167	0.9450	0.9243	0.8290	4.4146	4.7755	5.2000	N	5.2000	3.7222	n<10
BARIUM	mg/kg	9.0000	9.0000	16.1111	5.6290	0.9077	0.9395	0.8290	19.6011	20.7352	26.1000				
BERYLLIUM	mg/kg	5.0000	9.0000	0.1067	0.0436	0.9182	0.8444	0.8290	0.1337	0.1747	0.1400				
CADMIUM	mg/kg	2.0000	9.0000	0.4544	0.2360	0.8431	0.8245	0.8290	0.8008	0.8616	0.9500				
CALCIUM	mg/kg	8.0000	9.0000	632.3589	514.7270	0.7974	0.9799	0.8290	951.5196	1343.4204	1650.0000				
CHROMIUM	mg/kg	9.0000	9.0000	15.8056	6.6437	0.8771	0.9765	0.8290	19.9247	21.1489	30.7000	L	30.7000	15.8056	n<10
COBALT	mg/kg	7.0000	9.0000	1.7744	1.2598	0.9149	0.9195	0.8290	2.5555	5.3816	4.4000				
COPPER	mg/kg	8.0000	9.0000	3.2222	2.2890	0.8349	0.9766	0.8290	4.6414	5.7822	8.4000				
CYANIDE	mg/kg	8.0000	7.0000	0.4543	0.1688	0.7506	0.6021	0.8036	0.5783	1.0730	0.6000				
IRON	mg/kg	9.0000	9.0000	13991.1111	5109.0445	0.9404	0.9681	0.8290	17156.7167	18436.1390	24100.0000	L	24100.0000	13991.1111	n<10
LEAD	mg/kg	15.0000	15.0000	18.2700	17.9425	0.7743	0.8983	0.8810	26.4283	33.5585	66.0000				
MAGNESIUM	mg/kg	8.0000	9.0000	123.2667	55.6639	0.8657	0.9631	0.8290	157.7783	172.3662	237.0000				
MANGANESE	mg/kg	9.0000	9.0000	244.2833	302.9953	0.7828	0.9648	0.8290	432.1404	2488.2156	898.0000	L	898.0000	244.2833	n<10
MERCURY	mg/kg	7.0000	9.0000	0.0333	0.0166	0.9685	0.9422	0.8290	0.0437	0.0581	0.0600				
NICKEL	mg/kg	5.0000	9.0000	2.1083	0.8252	0.7833	0.8027	0.8290	2.6200	2.8072	3.3000				
POTASSIUM	mg/kg	6.0000	8.0000	132.2750	55.1996	0.9059	0.8206	0.8180	169.2578	199.9338	202.0000				
SELENIUM	mg/kg	6.0000	9.0000	1.1556	0.8407	0.8105	0.7883	0.8290	1.6768	4.1995	2.1000				
SILVER	mg/kg	4.0000	9.0000	0.4526	0.3106	0.8117	0.8909	0.8290	0.6454	0.9098	0.9000				
SODIUM	mg/kg	3.0000	9.0000	32.0167	57.6825	0.5008	0.7852	0.8290	67.7798	106.7384	184.5000				
VANADIUM	mg/kg	9.0000	9.0000	37.7556	14.5740	0.9412	0.9596	0.8290	46.7915	51.1671	63.7000	L	63.7000	37.7556	n<10
ZINC	mg/kg	9.0000	9.0000	4.1944	2.3941	0.8897	0.9774	0.8290	5.6788	6.7714	8.8000				
1,2-DICHLOROETHENE (TOTAL)	µg/g	1.0000	15.0000	113.0833	251.7700	0.4882	0.6825	0.8810	227.5602	727.0840	160.0000				
2-BUTANONE	µg/g	1.0000	13.0000	121.6346	268.1518	0.4776	0.6763	0.8660	254.1654	839.6044	28.0000				
ACETONE	µg/g	3.0000	15.0000	117.8833	247.6211	0.4926	0.6912	0.8810	230.4737	686.6414	60.0000				
METHYLENE CHLORIDE	µg/g	2.0000	15.0000	104.1500	252.3209	0.4346	0.6250	0.8810	218.6774	343.1879	15.0000				
TOLUENE	µg/g	1.0000	15.0000	103.0167	252.7768	0.4322	0.6184	0.8810	217.9513	370.0509	9.0000				
TRICHLOROETHENE	µg/g	4.0000	15.0000	73.4667	192.4075	0.4112	0.6162	0.8810	160.9521	256.7018	180.0000				
XYLENES, TOTAL	µg/g	1.0000	15.0000	104.0833	252.3852	0.4377	0.6576	0.8810	218.8399	410.9485	25.0000				
2-METHYLNAPHTHALENE	µg/g	4.0000	15.0000	813.1000	1459.7784	0.5167	0.7296	0.8810	1476.8441	1801.4708	4700.0000				
BENZOGX,H,IPERYLENE	µg/g	1.0000	15.0000	285.8000	281.1030	0.4850	0.6067	0.8810	413.6142	392.7254	92.0000				
BIS(2-ETHYLHEXYL)PHTHALATE	µg/g	4.0000	15.0000	287.0333	291.6632	0.5620	0.8062	0.8810	399.6492	441.1811	160.0000				
DIBENZOFURAN	µg/g	1.0000	15.0000	244.1667	209.3648	0.5257	0.5808	0.8810	339.3624	293.4806	220.0000				
FLUORENE	µg/g	1.0000	15.0000	312.5000	278.4590	0.5267	0.5748	0.8810	439.5667	426.1496	480.0000				
NAPHTHALENE	µg/g	3.0000	15.0000	860.1667	2162.8469	0.5626	0.5821	0.8810	1843.4668	1335.7069	8600.0000				
PENTACHLOROPHENOL	µg/g	1.0000	15.0000	658.6333	729.5024	0.5667	0.8074	0.8810	990.3295	1229.2214	82.0000				
PHENANTHRENE	µg/g	2.0000	15.0000	245.1667	211.8129	0.4049	0.5745	0.8810	341.4755	302.1621	300.0000				
DIELDRIN	µg/g	3.0000	9.0000	3.9694	4.1751	0.5820	0.5910	0.8290	6.5580	8.2407	13.0000				
GAMMA-CHLORDANE	µg/g	1.0000	9.0000	0.9083	0.1928	0.5221	0.4772	0.8290	1.0279	1.1380	0.4000				
4,4'-DDD	µg/g	1.0000	9.0000	1.9861	0.2369	0.6017	0.6334	0.8290	2.1330	2.1296	2.8000				
TOTAL PETROLEUM HYDROCARBONS (TPH (C8-C40))	mg/kg	10.0000	13.0000	1053.7654	2673.8846	0.4605	0.9652	0.8660	2375.3004	766421.7662	9610.0000				
		1.0000	2.0000	30.3500	35.9917	1.0000	1.0000	0.0000	*****	30455088407507	55.8000				

Associated Samples:

30B00101
 30B00201
 30B00301
 30B00401
 30B00501
 30B00601
 30SB02-0-2(93)
 30SB03-0-2(93)
 30SB04-0-2(93)
 30SB1-2-4(92)
 30SB1-2-4(92)-AVG
 30SB1-2-4(92)-D
 30SB5-0-2(93)
 30SB6-0-2(93)
 30SB7-0-2(93)
 W30SB00901
 W30SB01301

Table D9-5
Statistics: Site 32 Surface Soil without Concrete
NAS Whiting Field, Milton, Florida

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	STANDARD DEVIATION	W NORMAL	W LOGNORMAL	W TEST	UCL - NORMAL	UCL - LOGNORMAL	DETECTS - MAX	Distn	Rep Conc RME	Rep Conc CTE	Comment
ALUMINUM	mg/kg	7.0000	7.0000	12220.0000	6704.3394	0.7763	0.8438	0.8030	17143.5661	20727.1658	21900.0000	L	21900.0000	12220.0000	n<10
ANTIMONY	mg/kg	1.0000	7.0000	2.5786	1.6800	0.7657	0.8481	0.8030	3.7977	4.7662	6.0000	L	6.0000	2.5786	n<10
ARSENIC	mg/kg	6.0000	7.0000	1.1543	0.9841	0.8085	0.9360	0.8030	1.8770	3.9184	2.8000	L	2.8000	1.1543	n<10
BARIIUM	mg/kg	7.0000	7.0000	11.0929	2.2661	0.7792	0.8413	0.8030	12.7571	12.8890	15.9000				
BERYLLIUM	mg/kg	4.0000	7.0000	0.0936	0.0609	0.7289	0.8030	0.8030	0.1383	0.1628	0.2200				
CALCIUM	mg/kg	7.0000	7.0000	426.5714	181.2364	0.8672	0.8886	0.8030	559.6687	634.1419	712.0000				
CHROMIUM	mg/kg	7.0000	7.0000	12.2714	6.5797	0.8953	0.9150	0.8030	17.1035	22.4088	22.5000				
COBALT	mg/kg	5.0000	7.0000	1.1143	0.4079	0.9156	0.9100	0.8030	1.4579	1.7263	1.8000				
COPPER	mg/kg	7.0000	7.0000	3.7143	1.1936	0.9508	0.8664	0.8030	4.5909	5.4637	5.1000				
CYANIDE	mg/kg	4.0000	7.0000	0.3186	0.2266	0.7715	0.7160	0.8030	0.4850	1.5595	0.5800				
IRON	mg/kg	7.0000	7.0000	7202.1429	3856.1313	0.8763	0.9081	0.8030	10034.0278	12831.8966	13200.0000	L	13200.0000	7202.1429	n<10
LEAD	mg/kg	7.0000	7.0000	7.9429	10.3574	0.6123	0.7628	0.8030	15.5492	28.7497	30.7000				
MAGNESIUM	mg/kg	7.0000	7.0000	125.0143	46.4350	0.9533	0.9647	0.8030	159.1154	180.4807	207.0000				
MANGANESE	mg/kg	7.0000	7.0000	57.5214	31.8129	0.9398	0.8791	0.8030	80.8844	162.3289	95.5000				
MERCURY	mg/kg	6.0000	7.0000	0.0293	0.0110	0.8986	0.8141	0.8030	0.0373	0.0499	0.0400				
NICKEL	mg/kg	5.0000	7.0000	2.7786	1.2871	0.8741	0.8430	0.8030	3.7238	5.6106	4.0000				
POTASSIUM	mg/kg	7.0000	7.0000	200.8571	52.7460	0.9542	0.9370	0.8030	239.5930	257.2720	273.0000				
SELENIUM	mg/kg	2.0000	7.0000	0.7082	1.3267	0.5498	0.8985	0.8030	1.6825	13.7718	3.7000				
SILVER	mg/kg	2.0000	7.0000	0.4429	0.3737	0.6790	0.7314	0.8030	0.7173	0.9603	1.2000				
SODIUM	mg/kg	6.0000	7.0000	83.9929	88.2583	0.7465	0.8328	0.8030	148.8084	2408.5634	193.0000				
VANADIUM	mg/kg	7.0000	7.0000	19.3000	11.0820	0.8705	0.8956	0.8030	27.4384	36.6650	36.8000	L	36.8000	19.3000	n<10
ZINC	mg/kg	7.0000	7.0000	5.8000	3.0243	0.9717	0.9749	0.8030	8.0210	11.2582	10.6000				
ACETONE	µg/kg	4.0000	7.0000	131.7857	258.0946	0.5046	0.8911	0.8030	321.3265	42087.7708	175.0000				
TRICHLOROETHENE	µg/kg	2.0000	7.0000	105.7143	261.7685	0.4782	0.8494	0.8030	298.9531	58416.0644	2.0000				
XYLENES, TOTAL	µg/kg	1.0000	7.0000	105.5714	262.1262	0.4582	0.5407	0.8030	298.0729	5584.2362	11.0000				
2-METHYLNAPHTHALENE	µg/kg	2.0000	7.0000	2375.7143	5570.3205	0.4752	0.6228	0.8030	6486.4739	77890.2236	15000.0000				
2,4-DIMETHYLPHENOL	µg/kg	1.0000	7.0000	370.0000	498.3389	0.4661	0.4967	0.8030	735.9726	945.0717	1500.0000				
ACENAPHTHENE	µg/kg	1.0000	7.0000	355.7143	460.5470	0.4671	0.4981	0.8030	693.9331	868.5054	1400.0000				
FLUORANTHENE	µg/kg	1.0000	7.0000	659.7143	1319.4995	0.4844	0.7128	0.8030	1628.7349	6067.9004	53.0000				
FLUORENE	µg/kg	1.0000	7.0000	527.1429	914.0745	0.4602	0.4877	0.8030	1198.4254	2032.5146	2600.0000				
N-NITROSODIPHENYLAMINE	µg/kg	1.0000	7.0000	384.2857	536.1314	0.4652	0.4954	0.8030	778.0126	1025.8556	1600.0000				
NAPHTHALENE	µg/kg	2.0000	7.0000	709.2857	939.7359	0.6581	0.6606	0.8030	1398.4136	5259.1017	2500.0000				
PHENANTHRENE	µg/kg	2.0000	7.0000	872.3571	1864.5396	0.4694	0.6134	0.8030	2241.6470	8039.8000	5100.0000				
PYRENE	µg/kg	2.0000	7.0000	307.2857	397.5025	0.5667	0.8020	0.8030	599.2056	1495.6540	1200.0000				
AROCLOR-1254	µg/kg	1.0000	7.0000	38.4286	53.6131	0.4652	0.4954	0.8030	77.8013	102.5856	160.0000				
4,4'-DDE	µg/kg	1.0000	7.0000	1.6629	0.4345	0.6076	0.5522	0.8030	1.9820	2.3796	0.8900				
4,4'-DDD	µg/kg	1.0000	7.0000	1.8786	0.1577	0.8117	0.8320	0.8030	1.9944	2.0663	2.2000				
TPH	mg/kg	4.0000	7.0000	2871.7571	4923.8411	0.6772	0.8332	0.8030	6487.7521	2.3953103E+16	12300.0000		12300.0000	2871.7571	n<10

Associated Samples:

32SB1-1-2(93)
32SB2-0-2(93)
32SB3-0-2(93)
32SB3-0-2(93)-AVG
32SB3-0-2(93)-D
32SB4-0-2(93)
32SB5-1-2(93)
32SB6-0-2(93)
32SB7-0-2(93)

Table D9-6
Statistics: Site 33 Surface Soil without Concrete
NAS Whiting Field, Milton, Florida

PARAMETER	UNITS	# DETECTS	COUNT	AVERAGE	STANDARD DEVIATION	W NORMAL	W LOGNORMAL	W TEST	SAMPLE UCL - NORMAL	SAMPLE UCL - LOGNORMAL	DETECTS - MAX	Dist'n	Rep Conc	Rep Conc	Comment
													RME	CTE	
ALUMINUM	mg/kg	5 0000	5 0000	13570.0000	4190.3222	0.9103	0.9252	0.7620	17565.3020	19653.7961	19900.0000	L	19900.0000	13570.0000	n<10
ARSENIC	mg/kg	5 0000	5 0000	3.6720	4.4655	0.7264	0.8927	0.7620	7.9488	99.0411	11.5000	L	11.5000	3.6720	n<10
BARIUM	mg/kg	5 0000	5 0000	15.5700	4.5792	0.8384	0.8923	0.7620	19.9361	21.6217	23.2000				
CADMIUM	mg/kg	5 0000	5 0000	0.8570	0.7580	0.8798	0.8151	0.7620	1.5797	2.9714	2.2000				
CALCIUM	mg/kg	5 0000	5 0000	554.6000	212.0031	0.9255	0.9040	0.7620	756.7363	1008.4966	795.0000				
CHROMIUM	mg/kg	5 0000	5 0000	10.3100	3.4188	0.9045	0.9371	0.7620	13.5697	15.3566	15.4500				
COBALT	mg/kg	4 0000	5 0000	1.2500	0.4153	0.9569	0.9051	0.7620	1.8460	2.0710	1.8000				
COPPER	mg/kg	5 0000	5 0000	5.5300	1.9989	0.9725	0.9429	0.7620	7.4368	9.6211	8.0000				
IRON	mg/kg	5 0000	5 0000	7886.0000	3474.4539	0.8860	0.7192	0.7620	11198.7507	12625.9662	14050.0000	L	14050.0000	7886.0000	n<10
LEAD	mg/kg	8 0000	8 0000	8.5063	5.1148	0.8555	0.9446	0.8180	11.9329	15.9023	16.7000				
MAGNESIUM	mg/kg	5 0000	5 0000	140.5800	39.6067	0.9039	0.9448	0.7620	178.3434	194.8121	204.0000				
MANGANESE	mg/kg	5 0000	5 0000	113.1900	50.2307	0.9693	0.8953	0.7620	161.0829	285.1641	169.0000				
MERCURY	mg/kg	4 0000	5 0000	0.0510	0.0407	0.8409	0.9847	0.7620	0.0898	0.2362	0.1200				
NICKEL	mg/kg	2 0000	5 0000	1.6200	1.1724	0.7649	0.7711	0.7620	2.7376	5.2629	3.5000				
POTASSIUM	mg/kg	4 0000	5 0000	118.2000	32.5691	0.9774	0.9367	0.7620	149.2819	172.0390	160.0000				
SELENIUM	mg/kg	3 0000	5 0000	0.3310	0.2194	0.8770	0.8419	0.7620	0.5402	4.5787	0.4800				
SODIUM	mg/kg	4 0000	5 0000	162.6000	65.0148	0.8603	0.7539	0.7620	224.5890	426.5159	218.0000				
VANADIUM	mg/kg	5 0000	5 0000	21.0000	9.8395	0.8973	0.7732	0.7620	30.3815	35.0515	36.4000	L	36.4000	21.0000	n<10
ZINC	mg/kg	5 0000	5 0000	12.8200	7.2396	0.8361	0.8740	0.7620	19.7227	33.0089	21.9000				
1,1,1-TRICHLOROETHANE	µg/kg	1 0000	8 0000	4.6250	1.8274	0.6780	0.6328	0.8180	5.0493	9.3712	1.0000				
1,2-DICHLOROETHENE (TOTAL)	µg/kg	2 0000	8 0000	4.3125	1.7918	0.7304	0.7207	0.8180	5.5128	6.9523	2.0000				
2-BUTANONE	µg/kg	1 0000	7 0000	5.3571	0.6268	0.6593	0.6303	0.8030	5.8174	5.9410	4.0000				
METHYLENE CHLORIDE	µg/kg	3 0000	8 0000	8.3750	5.1738	0.7877	0.9260	0.8180	9.8413	14.8318	3.0000				
TETRACHLOROETHENE	µg/kg	1 0000	8 0000	4.7500	1.5584	0.6681	0.6502	0.8180	5.7841	7.0242	2.0000				
TRICHLOROETHENE	µg/kg	4 0000	8 0000	37.6875	49.7314	0.7414	0.8902	0.8180	71.0067	677.1412	130.0000				
XYLENES, TOTAL	µg/kg	1 0000	8 0000	5.8125	2.3443	0.6879	0.7303	0.8180	7.3831	8.1921	11.0000				
2-METHYLNAPHTHALENE	µg/kg	1 0000	8 0000	440.0000	731.3539	0.4208	0.4286	0.8180	929.9952	1093.0339	2250.0000				
BIS(2-ETHYLHEXYL)PHTHALATE	µg/kg	2 0000	8 0000	196.0825	96.4944	0.7161	0.7513	0.8180	260.7122	321.4722	410.0000				
FLUORENE	µg/kg	1 0000	8 0000	167.2500	40.1666	0.4640	0.4474	0.8180	184.1610	225.7712	68.0000				
NAPHTHALENE	µg/kg	1 0000	8 0000	197.5000	45.5129	0.4539	0.4649	0.8180	227.9929	227.0888	310.0000				
ALPHA-CHLORDANE	µg/kg	1 0000	5 0000	10.7500	21.9415	0.5538	0.5737	0.7620	31.6703	17527.9028	50.0000				
DIELDRIN	µg/kg	1 0000	5 0000	4.0650	4.9951	0.5597	0.5749	0.7620	8.8276	27.2155	13.0000				
GAMMA-CHLORDANE	µg/kg	1 0000	5 0000	16.1500	34.0182	0.5532	0.5718	0.7620	48.5831	146544.5419	77.0000				
HEPTACHLOR	µg/kg	1 0000	5 0000	1.4500	1.1467	0.5838	0.6161	0.7620	2.5434	3.8023	3.5000				
4,4'-DDE	µg/kg	1 0000	5 0000	1.5070	0.7547	0.6164	0.5762	0.7620	2.2268	37.5402	0.1800				
4,4'-DDT	µg/kg	1 0000	5 0000	1.5950	0.5586	0.6385	0.6042	0.7620	2.1276	3.5120	0.6000				
TPH (C8-C40)		1 0000	1 0000	10.7000	0.0000	*****	*****	0.0000	*****	0.0000	10.7000				
TOTAL PETROLEUM HYDROCARBONS	mg/kg	4 0000	7 0000	335.5000	866.2932	0.4605	0.8086	0.8030	971.6927	16934003.8194	2300.0000		2300.0000	335.5000	n<10

Associated Samples:

33B00101
33B00201
33B00301
33SB1-3-5(92)
33SB2-2-4(92)
33SB4-3-5(92)
33SB5-0-2(92)
33SB5-0-2(92)-AVG
33SB5-0-2(92)-D
W33SB000601

TABLE D9-7
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 30 SURFACE SOIL WITHOUT CONCRETE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil without Concrete
Exposure Point: Site 30

Chemical of Potential Concern	Units	Arithmetic Mean ⁽¹⁾	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale
aluminum	mg/kg	15960.00	22144.46	41600		mg/kg	41600.00	Maximum	n<10	15960	Arithmetic Mean	n<10
arsenic	mg/kg	3.72	4.41	5.2		mg/kg	5.20	Maximum	n<10	3.7	Arithmetic Mean	n<10
chromium	mg/kg	15.81	19.92	30.7	--	mg/kg	30.70	Maximum	n<10	15.8	Arithmetic Mean	n<10
iron	mg/kg	13991.11	17158.72	24100	--	mg/kg	24100.00	Maximum	n<10	13991	Arithmetic Mean	n<10
manganese	mg/kg	244.28	432.14	898	--	mg/kg	898.00	Maximum	n<10	244	Arithmetic Mean	n<10
vanadium	mg/kg	37.76	46.79	63.7	--	mg/kg	63.70	Maximum	n<10	37.8	Arithmetic Mean	n<10

¹ For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

Statistics: 95% UCL of log-transformed data (95% UCL-T), 95% of the normal data (UCL)

Refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992

mg/kg milligram per kilogram
UCL upper confidence limit
N/A not applicable
n number of samples
EPC exposure point concentration

TABLE D9-8
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 32 SURFACE SOIL WITHOUT CONCRETE
NAS WHITING FIELD, MILTON, FLORIDA

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil without Concrete
Exposure Point: Site 32

Chemical of Potential Concern	Units	Arithmetic Mean ⁽¹⁾	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale
aluminum	mg/kg	12220	17143.57	21900.00	--	mg/kg	21900	Maximum	n<10	12220	Arithmetic Mean	n<10
antimony	mg/kg	2.58	3.80	6.00	--	mg/kg	6.0	Maximum	n<10	2.6	Arithmetic Mean	n<10
arsenic	mg/kg	1.15	1.88	2.80	--	mg/kg	2.8	Maximum	n<10	1.2	Arithmetic Mean	n<10
iron	mg/kg	7202.14	10034.03	13200.00	--	mg/kg	13200	Maximum	n<10	7202	Arithmetic Mean	n<10
vanadium	mg/kg	19.3	27.44	36.80	--	mg/kg	36.8	Maximum	n<10	19.3	Arithmetic Mean	n<10
TPH	mg/kg	2871.76	6487.75	12300.00	--	mg/kg	12300	Maximum	n<10	2872	Arithmetic Mean	n<11

¹ For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

Statistics: 95% UCL of log-transformed data (95% UCL-T)

Refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992

mg/kg milligram per kilogram
UCL upper confidence limit
N/A not applicable
n number of samples
EPC exposure point concentration

**TABLE D9-9
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 33 SURFACE SOIL WITHOUT CONCRETE
NAS WHITING FIELD, MILTON, FLORIDA**

Scenario timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil without Concrete
Exposure Point: Site 33

Chemical of Potential Concern	Units	Arithmetic Mean ⁽¹⁾	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value ¹	Medium EPC Statistic	Medium EPC Rationale
aluminum	mg/kg	13570	17565.30	19900.00	--	mg/kg	19900	Maximum	n<10	13570	Average	n<10
arsenic	mg/kg	3.67	7.95	11.50	--	mg/kg	11.5	Maximum	n<10	3.7	Average	n<10
iron	mg/kg	7886	11198.75	14050.00	--	mg/kg	14050	Maximum	n<10	7886	Average	n<10
vanadium	mg/kg	21	30.38	38.40	--	mg/kg	38.4	Maximum	n<10	21	Average	n<10

¹For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

Statistics: 95% UCL of log-transformed data (95% UCL-T)

Refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992

mg/kg	milligram per kilogram
UCL	upper confidence limit
N/A	not applicable
n	number of samples
EPC	exposure point concentration

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	1.6E-03	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	51.6%
Arsenic	5.2	2.0E-07	1.4E-06	1.50E+00	3.00E-04	3.1E-07	100.0%	4.7E-03	21.5%
Chromium	30.7	1.2E-06	8.4E-06	NA	5.00E-03	NA	NA	1.7E-03	7.6%
Manganese	898	3.5E-05	2.5E-04	NA	1.40E-01	NA	NA	1.8E-03	8.0%
Vanadium	63.7	2.5E-06	1.7E-05	NA	7.00E-03	NA	NA	2.5E-03	11.3%
					Total	3.1E-07	100.0%	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	7.42E-05	5.20E-04	NA	1.00E-01	NA	NA	5.2E-03	13.2%
Arsenic	5.2	0.032	2.97E-07	2.08E-06	3.66	1.23E-04	1.1E-06	100.0%	1.7E-02	43.0%
Chromium	30.7	0.001	5.48E-08	3.83E-07	NA	1.00E-04	NA	NA	3.8E-03	9.8%
Manganese	898	0.001	1.60E-06	1.12E-05	NA	5.60E-03	NA	NA	2.0E-03	5.1%
Vanadium	63.7	0.001	1.14E-07	7.96E-07	NA	7.00E-05	NA	NA	1.1E-02	28.9%
Total							1.1E-06	100.0%	3.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.1E-02	5.2E-03	1.7E-02	27.0%
Arsenic	3.1E-07	1.1E-06	1.4E-06	100.0%	4.7E-03	1.7E-02	2.2E-02	35.3%
Chromium	NA	NA	NA	NA	1.7E-03	3.8E-03	5.5E-03	9.0%
Manganese	NA	NA	NA	NA	1.8E-03	2.0E-03	3.8E-03	6.1%
Vanadium	NA	NA	NA	NA	2.5E-03	1.1E-02	1.4E-02	22.6%
Total	3.1E-07	1.1E-06	1.4E-06	100.0%	2.2E-02	3.9E-02	6.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	3.8E-04	2.6E-03	NA	3.00E-02	NA	NA	8.8E-02	100.0%
					Total	NA	NA	8.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 1,013 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	1.71E-04	1.20E-03	NA	2.00E-02	NA	NA	6.0E-02	100.0%
						Total	NA	NA	6.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	8.8E-02	6.0E-02	1.5E-01	100.0%
Total	NA	NA	NA	NA	8.8E-02	6.0E-02	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	9.4E-04	6.6E-03	NA	3.00E-01	NA	NA	2.2E-02	100.0%
					Total	NA	NA	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	4.30E-05	3.01E-04	NA	4.50E-02	NA	NA	6.7E-03	100.0%
						Total	NA	NA	6.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.2E-02	6.7E-03	2.9E-02	100.0%
Total	NA	NA	NA	NA	2.2E-02	6.7E-03	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 3.9E-09 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.4E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	6.2E-05	2.2E-03	NA	1.00E+00	NA	NA	2.2E-03	41.4%
Arsenic	3.7	1.4E-08	5.1E-07	1.50E+00	3.00E-04	2.2E-08	100.0%	1.7E-03	32.0%
Chromium	15.8	6.2E-08	2.2E-06	NA	5.00E-03	NA	NA	4.3E-04	8.2%
Manganese	244	9.5E-07	3.3E-05	NA	1.40E-01	NA	NA	2.4E-04	4.5%
Vanadium	37.8	1.5E-07	5.2E-06	NA	7.00E-03	NA	NA	7.4E-04	14.0%
					Total	2.2E-08	100.0%	5.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	1,013 Skin surface available for contact (cm ² /event)
AF =	0.2 Soil to skin adherence factor (mg/cm ²)
ABS =	Chemical Specific Absorption factor (unitless)
EF =	45 Exposure frequency (events/year)
ED =	Exposure duration (years)
BW =	Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.6E-07 kg-soil/kg-wt/day
Chronic Daily Intake = 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	0.001	5.70E-06	1.99E-04	NA	1.00E-01	NA	NA	2.0E-03	8.6%
Arsenic	3.7	0.032	4.22E-08	1.48E-06	3.66	1.23E-04	1.5E-07	100.0%	1.2E-02	51.6%
Chromium	15.8	0.001	5.64E-09	1.97E-07	NA	1.00E-04	NA	NA	2.0E-03	8.5%
Manganese	244	0.001	8.71E-08	3.05E-06	NA	5.60E-03	NA	NA	5.4E-04	2.3%
Vanadium	37.8	0.001	1.35E-08	4.72E-07	NA	7.00E-05	NA	NA	6.7E-03	29.0%
Total							1.5E-07	100.0%	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.2E-03	2.0E-03	4.2E-03	14.6%
Arsenic	2.2E-08	1.5E-07	1.8E-07	100.0%	1.7E-03	1.2E-02	1.4E-02	48.0%
Chromium	NA	NA	NA	NA	4.3E-04	2.0E-03	2.4E-03	8.4%
Manganese	NA	NA	NA	NA	2.4E-04	5.4E-04	7.8E-04	2.7%
Vanadium	NA	NA	NA	NA	7.4E-04	6.7E-03	7.5E-03	26.2%
Total	2.2E-08	1.5E-07	1.8E-07	100.0%	5.3E-03	2.3E-02	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	2.1E-03	7.3E-03	NA	1.00E+00	NA	NA	7.3E-03	51.6%
Arsenic	5.2	2.6E-07	9.2E-07	1.50E+00	3.00E-04	3.9E-07	100.0%	3.1E-03	21.5%
Chromium	30.7	1.5E-06	5.4E-06	NA	5.00E-03	NA	NA	1.1E-03	7.6%
Manganese	898	4.5E-05	1.6E-04	NA	1.40E-01	NA	NA	1.1E-03	8.0%
Vanadium	63.7	3.2E-06	1.1E-05	NA	7.00E-03	NA	NA	1.6E-03	11.3%
Total						3.9E-07	100.0%	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	1.20E-04	4.21E-04	NA	1.00E-01	NA	NA	4.2E-03	13.2%
Arsenic	5.2	0.032	4.81E-07	1.69E-06	3.66E+00	1.23E-04	1.8E-06	100.0%	1.4E-02	43.0%
Chromium	30.7	0.001	8.88E-08	3.11E-07	NA	1.00E-04	NA	NA	3.1E-03	9.8%
Manganese	898	0.001	2.60E-06	9.09E-06	NA	5.60E-03	NA	NA	1.6E-03	5.1%
Vanadium	63.7	0.001	1.84E-07	6.45E-07	NA	7.00E-05	NA	NA	9.2E-03	28.9%
Total							1.8E-06	100.0%	3.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	7.3E-03	4.2E-03	1.2E-02	25.1%
Arsenic	3.9E-07	1.8E-06	2.2E-06	100.0%	3.1E-03	1.4E-02	1.7E-02	36.4%
Chromium	NA	NA	NA	NA	1.1E-03	3.1E-03	4.2E-03	9.1%
Manganese	NA	NA	NA	NA	1.1E-03	1.6E-03	2.8E-03	6.0%
Vanadium	NA	NA	NA	NA	1.6E-03	9.2E-03	1.1E-02	23.5%
Total	3.9E-07	1.8E-06	2.2E-06	100.0%	1.4E-02	3.2E-02	4.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 5.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	4.8E-04	1.7E-03	NA	3.00E-02	NA	NA	5.6E-02	100.0%
					Total	NA	NA	5.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	45 Exposure frequency (events/year)
ED =	20 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	2.78E-04	9.73E-04	NA	2.00E-02	NA	NA	4.9E-02	100.0%
						Total	NA	NA	4.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.6E-02	4.9E-02	1.1E-01	100.0%
Total	NA	NA	NA	NA	5.6E-02	4.9E-02	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	1.2E-03	4.2E-03	NA	3.00E-01	NA	NA	1.4E-02	100.0%
					Total	NA	NA	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	6.97E-05	2.44E-04	NA	4.50E-02	NA	NA	5.4E-03	100.0%
						Total	NA	NA	5.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.4E-02	5.4E-03	2.0E-02	100.0%
Total	NA	NA	NA	NA	1.4E-02	5.4E-03	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	50 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	45 Exposure Frequency (days/year)
ED =	7 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.8E-09 kg-soil/kg-wt/day

Chronic Daily Intake = 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	1.4E-04	1.4E-03	NA	1.00E+00	NA	NA	1.4E-03	41.4%
Arsenic	3.7	3.3E-08	3.3E-07	1.50E+00	3.00E-04	4.9E-08	100.0%	1.1E-03	32.0%
Chromium	15.8	1.4E-07	1.4E-06	NA	5.00E-03	NA	NA	2.8E-04	8.2%
Manganese	244	2.1E-06	2.1E-05	NA	1.40E-01	NA	NA	1.5E-04	4.5%
Vanadium	37.8	3.3E-07	3.3E-06	NA	7.00E-03	NA	NA	4.8E-04	14.0%
Total						4.9E-08	100.0%	3.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	0.001	2.81E-06	2.81E-05	NA	1.00E-01	NA	NA	2.8E-04	8.6%
Arsenic	3.7	0.032	2.09E-08	2.09E-07	3.66	1.23E-04	7.6E-08	100.0%	1.7E-03	51.6%
Chromium	15.8	0.001	2.78E-09	2.78E-08	NA	1.00E-04	NA	NA	2.8E-04	8.5%
Manganese	244	0.001	4.30E-08	4.30E-07	NA	5.60E-03	NA	NA	7.7E-05	2.3%
Vanadium	37.8	0.001	6.66E-09	6.66E-08	NA	7.00E-05	NA	NA	9.5E-04	29.0%
Total							7.6E-08	100.0%	3.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.4E-03	2.8E-04	1.7E-03	25.2%
Arsenic	4.9E-08	7.6E-08	1.3E-07	100.0%	1.1E-03	1.7E-03	2.8E-03	41.6%
Chromium	NA	NA	NA	NA	2.8E-04	2.8E-04	5.6E-04	8.3%
Manganese	NA	NA	NA	NA	1.5E-04	7.7E-05	2.3E-04	3.4%
Vanadium	NA	NA	NA	NA	4.8E-04	9.5E-04	1.4E-03	21.4%
Total	4.9E-08	7.6E-08	1.3E-07	100.0%	3.4E-03	3.3E-03	6.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	7.3E-03	2.0E-02	NA	1.00E+00	NA	NA	2.0E-02	51.6%
Arsenic	5.2	9.1E-07	2.5E-06	1.50E+00	3.00E-04	1.4E-06	100.0%	8.5E-03	21.5%
Chromium	30.7	5.4E-06	1.5E-05	NA	5.00E-03	NA	NA	3.0E-03	7.6%
Manganese	898	1.6E-04	4.4E-04	NA	1.40E-01	NA	NA	3.1E-03	8.0%
Vanadium	63.7	1.1E-05	3.1E-05	NA	7.00E-03	NA	NA	4.5E-03	11.3%
Total						1.4E-06	100.0%	3.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	3.34E-04	9.36E-04	NA	1.00E-01	NA	NA	9.4E-03	13.2%
Arsenic	5.2	0.032	1.34E-06	3.74E-06	3.66	1.23E-04	4.9E-06	100.0%	3.0E-02	43.0%
Chromium	30.7	0.001	2.47E-07	6.91E-07	NA	1.00E-04	NA	NA	6.9E-03	9.8%
Manganese	898	0.001	7.22E-06	2.02E-05	NA	5.60E-03	NA	NA	3.6E-03	5.1%
Vanadium	63.7	0.001	5.12E-07	1.43E-06	NA	7.00E-05	NA	NA	2.0E-02	28.9%
Total							4.9E-06	100.0%	7.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.0E-02	9.4E-03	3.0E-02	27.0%
Arsenic	1.4E-06	4.9E-06	6.3E-06	100.0%	8.5E-03	3.0E-02	3.9E-02	35.3%
Chromium	NA	NA	NA	NA	3.0E-03	6.9E-03	9.9E-03	9.0%
Manganese	NA	NA	NA	NA	3.1E-03	3.6E-03	6.7E-03	6.1%
Vanadium	NA	NA	NA	NA	4.5E-03	2.0E-02	2.5E-02	22.6%
Total	1.4E-06	4.9E-06	6.3E-06	100.0%	3.9E-02	7.1E-02	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	1.7E-03	4.7E-03	NA	3.00E-02	NA	NA	1.6E-01	100.0%
					Total	NA	NA	1.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 2,300 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 250 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	7.72E-04	2.16E-03	NA	2.00E-02	NA	NA	1.1E-01	100.0%
Total							NA	NA	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.6E-01	1.1E-01	2.6E-01	100.0%
Total	NA	NA	NA	NA	1.6E-01	1.1E-01	2.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	4.2E-03	1.2E-02	NA	3.00E-01	NA	NA	3.9E-02	100.0%
					Total	NA	NA	3.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	2,300 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	250 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day****Chronic Daily Intake = 2.3E-05 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	1.94E-04	5.42E-04	NA	4.50E-02	NA	NA	1.2E-02	100.0%
Total							NA	NA	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	3.9E-02	1.2E-02	5.1E-02	100.0%
Total	NA	NA	NA	NA	3.9E-02	1.2E-02	5.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 6.3E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	1.0E-03	7.8E-03	NA	1.00E+00	NA	NA	7.8E-03	41.4%
Arsenic	3.7	2.3E-07	1.8E-06	1.50E+00	3.00E-04	3.5E-07	100.0%	6.0E-03	32.0%
Chromium	15.8	9.9E-07	7.7E-06	NA	5.00E-03	NA	NA	1.5E-03	8.2%
Manganese	244	1.5E-05	1.2E-04	NA	1.40E-01	NA	NA	8.5E-04	4.5%
Vanadium	37.8	2.4E-06	1.8E-05	NA	7.00E-03	NA	NA	2.6E-03	14.0%
					Total	3.5E-07	100.0%	1.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	0.001	9.24E-06	7.18E-05	NA	1.00E-01	NA	NA	7.2E-04	8.6%
Arsenic	3.7	0.032	6.85E-08	5.33E-07	3.66E+00	1.23E-04	2.5E-07	100.0%	4.3E-03	51.6%
Chromium	15.8	0.001	9.14E-09	7.11E-08	NA	1.00E-04	NA	NA	7.1E-04	8.5%
Manganese	244	0.001	1.41E-07	1.10E-06	NA	5.60E-03	NA	NA	2.0E-04	2.3%
Vanadium	37.8	0.001	2.19E-08	1.70E-07	NA	7.00E-05	NA	NA	2.4E-03	29.0%
Total							2.5E-07	100.0%	8.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	7.8E-03	7.2E-04	8.5E-03	31.3%
Arsenic	3.5E-07	2.5E-07	6.0E-07	100.0%	6.0E-03	4.3E-03	1.0E-02	38.0%
Chromium	NA	NA	NA	NA	1.5E-03	7.1E-04	2.3E-03	8.3%
Manganese	NA	NA	NA	NA	8.5E-04	2.0E-04	1.0E-03	3.8%
Vanadium	NA	NA	NA	NA	2.6E-03	2.4E-03	5.1E-03	18.6%
Total	3.5E-07	2.5E-07	6.0E-07	100.0%	1.9E-02	8.4E-03	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	4.4E-04	1.2E-03	NA	1.00E+00	NA	NA	1.2E-03	51.6%
Arsenic	5.2	5.5E-08	1.5E-07	1.50E+00	3.00E-04	8.2E-08	100.0%	5.1E-04	21.5%
Chromium	30.7	3.2E-07	9.0E-07	NA	5.00E-03	NA	NA	1.8E-04	7.6%
Manganese	898	9.4E-06	2.6E-05	NA	1.40E-01	NA	NA	1.9E-04	8.0%
Vanadium	63.7	6.7E-07	1.9E-06	NA	7.00E-03	NA	NA	2.7E-04	11.3%
Total						8.2E-08	100.0%	2.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	6.02E-05	1.69E-04	NA	1.00E-01	NA	NA	1.7E-03	13.2%
Arsenic	5.2	0.032	2.41E-07	6.74E-07	3.66	1.23E-04	8.8E-07	100.0%	5.5E-03	43.0%
Chromium	30.7	0.001	4.44E-08	1.24E-07	NA	1.00E-04	NA	NA	1.2E-03	9.8%
Manganese	898	0.001	1.30E-06	3.64E-06	NA	5.60E-03	NA	NA	6.5E-04	5.1%
Vanadium	63.7	0.001	9.22E-08	2.58E-07	NA	7.00E-05	NA	NA	3.7E-03	28.9%
Total							8.8E-07	100.0%	1.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.2E-03	1.7E-03	2.9E-03	19.2%
Arsenic	8.2E-08	8.8E-07	9.6E-07	100.0%	5.1E-04	5.5E-03	6.0E-03	39.6%
Chromium	NA	NA	NA	NA	1.8E-04	1.2E-03	1.4E-03	9.4%
Manganese	NA	NA	NA	NA	1.9E-04	6.5E-04	8.4E-04	5.5%
Vanadium	NA	NA	NA	NA	2.7E-04	3.7E-03	4.0E-03	26.2%
Total	8.2E-08	8.8E-07	9.6E-07	100.0%	2.4E-03	1.3E-02	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	1.0E-04	2.8E-04	NA	3.00E-02	NA	NA	9.4E-03	100.0%
					Total	NA	NA	9.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	1.39E-04	3.89E-04	NA	2.00E-02	NA	NA	1.9E-02	100.0%
Total							NA	NA	1.9E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	9.4E-03	1.9E-02	2.9E-02	100.0%
Total	NA	NA	NA	NA	9.4E-03	1.9E-02	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	2.5E-04	7.1E-04	NA	3.00E-01	NA	NA	2.4E-03	100.0%
					Total	NA	NA	2.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day****Chronic Daily Intake = 4.1E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	3.49E-05	9.76E-05	NA	4.50E-02	NA	NA	2.2E-03	100.0%
						Total	NA	NA	2.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.4E-03	2.2E-03	4.5E-03	100.0%
Total	NA	NA	NA	NA	2.4E-03	2.2E-03	4.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	3.3E-04	2.3E-02	NA	1.00E+00	NA	NA	2.3E-02	51.6%
Arsenic	5.2	4.2E-08	2.9E-06	1.50E+00	3.00E-04	6.3E-08	100.0%	9.8E-03	21.5%
Chromium	30.7	2.5E-07	1.7E-05	NA	5.00E-03	NA	NA	3.5E-03	7.6%
Manganese	898	7.2E-06	5.1E-04	NA	1.40E-01	NA	NA	3.6E-03	8.0%
Vanadium	63.7	5.1E-07	3.6E-05	NA	7.00E-03	NA	NA	5.1E-03	11.3%
					Total	6.3E-08	100.0%	4.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	4.01E-06	2.81E-04	NA	1.00E-01	NA	NA	2.8E-03	13.2%
Arsenic	5.2	0.032	1.60E-08	1.12E-06	3.66E+00	1.23E-04	5.9E-08	100.0%	9.1E-03	43.0%
Chromium	30.7	0.001	2.96E-09	2.07E-07	NA	1.00E-04	NA	NA	2.1E-03	9.8%
Manganese	898	0.001	8.66E-08	6.06E-06	NA	5.60E-03	NA	NA	1.1E-03	5.1%
Vanadium	63.7	0.001	6.14E-09	4.30E-07	NA	7.00E-05	NA	NA	6.1E-03	28.9%
Total							5.9E-08	100.0%	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.3E-02	2.8E-03	2.6E-02	39.4%
Arsenic	6.3E-08	5.9E-08	1.2E-07	100.0%	9.8E-03	9.1E-03	1.9E-02	28.4%
Chromium	NA	NA	NA	NA	3.5E-03	2.1E-03	5.5E-03	8.3%
Manganese	NA	NA	NA	NA	3.6E-03	1.1E-03	4.7E-03	7.0%
Vanadium	NA	NA	NA	NA	5.1E-03	6.1E-03	1.1E-02	16.9%
Total	6.3E-08	5.9E-08	1.2E-07	100.0%	4.5E-02	2.1E-02	6.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 8.1E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	7.7E-05	5.4E-03	NA	3.00E-02	NA	NA	1.8E-01	100.0%
					Total	NA	NA	1.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	9.27E-06	6.49E-04	NA	2.00E-02	NA	NA	3.2E-02	100.0%
						Total	NA	NA	3.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.8E-01	3.2E-02	2.1E-01	100.0%
Total	NA	NA	NA	NA	1.8E-01	3.2E-02	2.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 8.1E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	1.9E-04	1.4E-02	NA	3.00E-01	NA	NA	4.5E-02	100.0%
					Total	NA	NA	4.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs 24100	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	2.32E-06	1.63E-04	NA	4.50E-02	NA	NA	3.6E-03	100.0%
Total						NA	NA	NA	3.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	4.5E-02	3.6E-03	4.9E-02	100.0%
Total	NA	NA	NA	NA	4.5E-02	3.6E-03	4.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	2.0E-02	5.7E-02	NA	1.00E+00	NA	NA	5.7E-02	51.6%
Arsenic	5.2	2.4E-06	7.1E-06	1.50E+00	3.00E-04	3.7E-06	100.0%	2.4E-02	21.5%
Chromium	30.7	1.4E-05	4.2E-05	NA	5.00E-03	NA	NA	8.4E-03	7.6%
Manganese	898	4.2E-04	1.2E-03	NA	1.40E-01	NA	NA	8.8E-03	8.0%
Vanadium	63.7	3.0E-05	8.7E-05	NA	7.00E-03	NA	NA	1.2E-02	11.3%
Total						3.7E-06	100.0%	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	1.13E-03	3.31E-03	NA	1.00E-01	NA	NA	3.3E-02	13.2%
Arsenic	5.2	0.032	4.53E-06	1.32E-05	3.66E+00	1.23E-04	1.7E-05	100.0%	1.1E-01	43.0%
Chromium	30.7	0.001	8.36E-07	2.44E-06	NA	1.00E-04	NA	NA	2.4E-02	9.8%
Manganese	898	0.001	2.45E-05	7.13E-05	NA	5.60E-03	NA	NA	1.3E-02	5.1%
Vanadium	63.7	0.001	1.74E-06	5.06E-06	NA	7.00E-05	NA	NA	7.2E-02	28.9%
Total							1.7E-05	100.0%	2.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.7E-02	3.3E-02	9.0E-02	25.0%
Arsenic	3.7E-06	1.7E-05	2.0E-05	100.0%	2.4E-02	1.1E-01	1.3E-01	36.4%
Chromium	NA	NA	NA	NA	8.4E-03	2.4E-02	3.3E-02	9.1%
Manganese	NA	NA	NA	NA	8.8E-03	1.3E-02	2.2E-02	6.0%
Vanadium	NA	NA	NA	NA	1.2E-02	7.2E-02	8.5E-02	23.5%
Total	3.7E-06	1.7E-05	2.0E-05	100.0%	1.1E-01	2.5E-01	3.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	4.5E-03	1.3E-02	NA	3.00E-02	NA	NA	4.4E-01	100.0%
					Total	NA	NA	4.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	2.62E-03	7.64E-03	NA	2.00E-02	NA	NA	3.8E-01	100.0%
						Total	NA	NA	3.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.4E-01	3.8E-01	8.2E-01	100.0%
Total	NA	NA	NA	NA	4.4E-01	3.8E-01	8.2E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	1.1E-02	3.3E-02	NA	3.00E-01	NA	NA	1.1E-01	100.0%
Total						NA	NA	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	6.57E-04	1.91E-03	NA	4.50E-02	NA	NA	4.3E-02	100.0%
Total							NA	NA	4.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.1E-01	4.3E-02	1.5E-01	100.0%
Total	NA	NA	NA	NA	1.1E-01	4.3E-02	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	7.3E-04	7.3E-03	NA	1.00E+00	NA	NA	7.3E-03	41.4%
Arsenic	3.7	1.7E-07	1.7E-06	1.50E+00	3.00E-04	2.5E-07	100.0%	5.6E-03	32.0%
Chromium	15.8	7.2E-07	7.2E-06	NA	5.00E-03	NA	NA	1.4E-03	8.2%
Manganese	244	1.1E-05	1.1E-04	NA	1.40E-01	NA	NA	8.0E-04	4.5%
Vanadium	37.8	1.7E-06	1.7E-05	NA	7.00E-03	NA	NA	2.5E-03	14.0%
					Total	2.5E-07	100.0%	1.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,000 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : 7 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	0.001	1.46E-05	1.46E-04	NA	1.00E-01	NA	NA	1.5E-03	8.6%
Arsenic	3.7	0.032	1.08E-07	1.08E-06	3.66E+00	1.23E-04	4.0E-07	100.0%	8.8E-03	51.6%
Chromium	15.8	0.001	1.45E-08	1.45E-07	NA	1.00E-04	NA	NA	1.4E-03	8.5%
Manganese	244	0.001	2.23E-07	2.23E-06	NA	5.60E-03	NA	NA	4.0E-04	2.3%
Vanadium	37.8	0.001	3.46E-08	3.46E-07	NA	7.00E-05	NA	NA	4.9E-03	29.0%
Total							4.0E-07	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	7.3E-03	1.5E-03	8.8E-03	25.2%
Arsenic	2.5E-07	4.0E-07	6.5E-07	100.0%	5.6E-03	8.8E-03	1.4E-02	41.6%
Chromium	NA	NA	NA	NA	1.4E-03	1.4E-03	2.9E-03	8.3%
Manganese	NA	NA	NA	NA	8.0E-04	4.0E-04	1.2E-03	3.4%
Vanadium	NA	NA	NA	NA	2.5E-03	4.9E-03	7.4E-03	21.4%
Total	2.5E-07	4.0E-07	6.5E-07	100.0%	1.8E-02	1.7E-02	3.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	4.6E-02	5.3E-01	NA	1.00E+00	NA	NA	5.3E-01	51.6%
Arsenic	5.2	5.7E-06	6.6E-05	1.50E+00	3.00E-04	8.5E-06	100.0%	2.2E-01	21.5%
Chromium	30.7	3.4E-05	3.9E-04	NA	5.00E-03	NA	NA	7.9E-02	7.6%
Manganese	898	9.8E-04	1.1E-02	NA	1.40E-01	NA	NA	8.2E-02	8.0%
Vanadium	63.7	7.0E-05	8.1E-04	NA	7.00E-03	NA	NA	1.2E-01	11.3%
Total						8.5E-06	100.0%	1.0E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA adj =	766 Skin surface available for contact (cm ² year/kg)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
ABS =	Absorption factor (unitless)
EF =	350 Exposure frequency (events/year)
ED =	Exposure duration (years)
BW =	Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	41600	0.001	4.37E-04	5.09E-03	NA	1.00E-01	NA	NA	5.1E-02	13.2%
Arsenic	5.2	0.032	1.75E-06	2.04E-05	3.66	1.23E-04	6.4E-06	100.0%	1.7E-01	43.0%
Chromium	30.7	0.001	3.22E-07	3.76E-06	NA	1.00E-04	NA	NA	3.8E-02	9.8%
Manganese	898	0.001	9.42E-06	1.10E-04	NA	5.60E-03	NA	NA	2.0E-02	5.1%
Vanadium	63.7	0.001	6.68E-07	7.80E-06	NA	7.00E-05	NA	NA	1.1E-01	28.9%
Total							6.4E-06	100.0%	3.9E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.3E-01	5.1E-02	5.8E-01	41.2%
Arsenic	8.5E-06	6.4E-06	1.5E-05	100.0%	2.2E-01	1.7E-01	3.9E-01	27.4%
Chromium	NA	NA	NA	NA	7.9E-02	3.8E-02	1.2E-01	8.2%
Manganese	NA	NA	NA	NA	8.2E-02	2.0E-02	1.0E-01	7.2%
Vanadium	NA	NA	NA	NA	1.2E-01	1.1E-01	2.3E-01	16.1%
Total	8.5E-06	6.4E-06	1.5E-05	100.0%	1.0E+00	3.9E-01	1.4E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD

LOCATION: MILTON, FLORIDA SITE 30

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	1.1E-02	1.2E-01	NA	3.00E-02	NA	NA	4.1E+00	100.0%
					Total	NA	NA	4.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	1.01E-03	1.18E-02	NA	2.00E-02	NA	NA	5.9E-01	100.0%
Total							NA	NA	5.9E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.1E+00	5.9E-01	4.7E+00	100.0%
Total	NA	NA	NA	NA	4.1E+00	5.9E-01	4.7E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	2.6E-02	3.1E-01	NA	3.00E-01	NA	NA	1.0E+00	100.0%
					Total	NA	NA	1.0E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	24100	0.001	2.53E-04	2.95E-03	NA	4.50E-02	NA	NA	6.6E-02	100.0%
Total						NA	NA	NA	6.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.0E+00	6.6E-02	1.1E+00	100.0%
Total	NA	NA	NA	NA	1.0E+00	6.6E-02	1.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD -SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD -SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	1.9E-03	6.8E-02	NA	1.00E+00	NA	NA	6.8E-02	41.4%
Arsenic	3.7	4.5E-07	1.6E-05	1.50E+00	3.00E-04	6.8E-07	100.0%	5.3E-02	32.0%
Chromium	15.8	1.9E-06	6.8E-05	NA	5.00E-03	NA	NA	1.4E-02	8.2%
Manganese	244	3.0E-05	1.0E-03	NA	1.40E-01	NA	NA	7.4E-03	4.5%
Vanadium	37.8	4.6E-06	1.6E-04	NA	7.00E-03	NA	NA	2.3E-02	14.0%
Total						6.8E-07	100.0%	1.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD -SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj= :	663 Skin surface available for contact (cm ² ·year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD -SITE 30

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	15960	0.001	1.94E-05	6.78E-04	NA	1.00E-01	NA	NA	6.8E-03	8.6%
Arsenic	3.7	0.032	1.44E-07	5.03E-06	3.66E+00	1.23E-04	5.3E-07	100.0%	4.1E-02	51.6%
Chromium	15.8	0.001	1.92E-08	6.72E-07	NA	1.00E-04	NA	NA	6.7E-03	8.5%
Manganese	244	0.001	2.96E-07	1.04E-05	NA	5.60E-03	NA	NA	1.9E-03	2.3%
Vanadium	37.8	0.001	4.59E-08	1.61E-06	NA	7.00E-05	NA	NA	2.3E-02	29.0%
Total							5.3E-07	100.0%	7.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD -SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.8E-02	6.8E-03	7.5E-02	30.7%
Arsenic	6.8E-07	5.3E-07	1.2E-06	100.0%	5.3E-02	4.1E-02	9.4E-02	38.3%
Chromium	NA	NA	NA	NA	1.4E-02	6.7E-03	2.0E-02	8.3%
Manganese	NA	NA	NA	NA	7.4E-03	1.9E-03	9.3E-03	3.8%
Vanadium	NA	NA	NA	NA	2.3E-02	2.3E-02	4.6E-02	18.9%
Total	6.8E-07	5.3E-07	1.2E-06	100.0%	1.6E-01	7.9E-02	2.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD****LOCATION: MILTON, FLORIDA SITE 30****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	1.2E-03	4.1E-02	NA	3.00E-02	NA	NA	1.4E+00	100.0%
					Total	NA	NA	1.4E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	663 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD
 LOCATION: MILTON, FLORIDA SITE 30
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	9610	0.01	5.84E-04	4.08E-03	NA	2.00E-02	NA	NA	2.0E-01	100.0%
						Total	NA	NA	2.0E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD
LOCATION: MILTON, FLORIDA SITE 30
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.4E+00	2.0E-01	1.6E+00	100.0%
Total	NA	NA	NA	NA	1.4E+00	2.0E-01	1.6E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13991	1.7E-03	6.0E-02	NA	3.00E-01	NA	NA	2.0E-01	100.0%
					Total	NA	NA	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	663 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13991	0.001	8.50E-05	5.95E-04	NA	4.50E-02	NA	NA	1.3E-02	100.0%
Total						NA	NA	NA	1.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 30
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.0E-01	1.3E-02	2.1E-01	100.0%
Total	NA	NA	NA	NA	2.0E-01	1.3E-02	2.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	8.6E-04	6.0E-03	NA	1.00E+00	NA	NA	6.0E-03	42.5%
Antimony	6.0	2.3E-07	1.6E-06	NA	4.00E-04	NA	NA	4.1E-03	29.1%
Arsenic	2.8	1.1E-07	7.7E-07	1.50E+00	3.00E-04	1.6E-07	100.0%	2.6E-03	18.1%
Vanadium	36.8	1.4E-06	1.0E-05	NA	7.00E-03	NA	NA	1.4E-03	10.2%
Total						1.6E-07	100.0%	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	3.91E-05	2.74E-04	NA	1.00E-01	NA	NA	2.7E-03	9.9%
Antimony	6	0.001	1.07E-08	7.49E-08	NA	8.00E-06	NA	NA	9.4E-03	33.7%
Arsenic	2.8	0.032	1.60E-07	1.12E-06	3.66E+00	1.23E-04	5.9E-07	100.0%	9.1E-03	32.8%
Vanadium	36.8	0.001	6.57E-08	4.60E-07	NA	7.00E-05	NA	NA	6.6E-03	23.6%
Total							5.9E-07	100.0%	2.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.0E-03	2.7E-03	8.7E-03	20.9%
Antimony	NA	NA	NA	NA	4.1E-03	9.4E-03	1.3E-02	32.2%
Arsenic	1.6E-07	5.9E-07	7.5E-07	100.0%	2.6E-03	9.1E-03	1.2E-02	27.8%
Vanadium	NA	NA	NA	NA	1.4E-03	6.6E-03	8.0E-03	19.1%
Total	1.6E-07	5.9E-07	7.5E-07	100.0%	1.4E-02	2.8E-02	4.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 3.9E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	4.8E-04	3.4E-03	NA	3.00E-02	NA	NA	1.1E-01	100.0%
Total						NA	NA	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	2.19E-04	1.54E-03	NA	2.00E-02	NA	NA	7.7E-02	100.0%
						Total	NA	NA	7.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.1E-01	7.7E-02	1.9E-01	100.0%
Total	NA	NA	NA	NA	1.1E-01	7.7E-02	1.9E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	5.2E-04	3.6E-03	NA	3.00E-01	NA	NA	1.2E-02	100.0%
					Total	NA	NA	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	2.36E-05	1.65E-04	NA	4.50E-02	NA	NA	3.7E-03	100.0%
Total							NA	NA	3.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.2E-02	3.7E-03	1.6E-02	100.0%
Total	NA	NA	NA	NA	1.2E-02	3.7E-03	1.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	1.1E-03	3.9E-03	NA	1.00E+00	NA	NA	3.9E-03	42.5%
Antimony	6.0	3.0E-07	1.1E-06	NA	4.00E-04	NA	NA	2.6E-03	29.1%
Arsenic	2.8	1.4E-07	4.9E-07	1.5	3.00E-04	2.1E-07	100.0%	1.6E-03	18.1%
Vanadium	36.8	1.9E-06	6.5E-06	NA	7.00E-03	NA	NA	9.3E-04	10.2%
Total						2.1E-07	100.0%	9.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	6.34E-05	2.22E-04	NA	1.00E-01	NA	NA	2.2E-03	9.9%
Antimony	6	0.001	1.74E-08	6.08E-08	NA	8.00E-06	NA	NA	7.6E-03	33.7%
Arsenic	2.8	0.032	2.59E-07	9.07E-07	3.66	1.23E-04	9.5E-07	100.0%	7.4E-03	32.8%
Vanadium	36.8	0.001	1.06E-07	3.73E-07	NA	7.00E-05	NA	NA	5.3E-03	23.6%
Total							9.5E-07	100.0%	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	3.9E-03	2.2E-03	6.1E-03	19.2%
Antimony	NA	NA	NA	NA	2.6E-03	7.6E-03	1.0E-02	32.4%
Arsenic	2.1E-07	9.5E-07	1.2E-06	100.0%	1.6E-03	7.4E-03	9.0E-03	28.6%
Vanadium	NA	NA	NA	NA	9.3E-04	5.3E-03	6.2E-03	19.8%
Total	2.1E-07	9.5E-07	1.2E-06	100.0%	9.1E-03	2.3E-02	3.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	6.2E-04	2.2E-03	NA	3.00E-02	NA	NA	7.2E-02	100.0%
Total						NA	NA	7.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	3.56E-04	1.25E-03	NA	2.00E-02	NA	NA	6.2E-02	100.0%
Total							NA	NA	6.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	7.2E-02	6.2E-02	1.3E-01	100.0%
Total	NA	NA	NA	NA	7.2E-02	6.2E-02	1.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	6.6E-04	2.3E-03	NA	3.00E-01	NA	NA	7.7E-03	100.0%
					Total	NA	NA	7.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	45 Exposure frequency (events/year)
ED =	20 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	3.82E-05	1.34E-04	NA	4.50E-02	NA	NA	3.0E-03	100.0%
Total						NA	NA	NA	3.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	7.7E-03	3.0E-03	1.1E-02	100.0%
Total	NA	NA	NA	NA	7.7E-03	3.0E-03	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.8E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12200	1.1E-04	1.1E-03	NA	1.00E+00	NA	NA	1.1E-03	47.9%
Antimony	2.6	2.3E-08	2.3E-07	NA	4.00E-04	NA	NA	5.7E-04	25.5%
Arsenic	1.2	1.1E-08	1.1E-07	1.5	3.00E-04	1.6E-08	100.0%	3.5E-04	15.7%
Vanadium	19.3	1.7E-07	1.7E-06	NA	7.00E-03	NA	NA	2.4E-04	10.8%
					Total	1.6E-08	100.0%	2.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
AT _c = :	25,550 Averaging time for carcinogenic exposures (days)
AT _n = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12200	0.001	2.15E-06	2.15E-05	NA	1.00E-01	NA	NA	2.1E-04	11.8%
Antimony	2.6	0.001	4.58E-10	4.58E-09	3.66E+00	8.00E-06	1.7E-09	100.0%	5.7E-04	31.4%
Arsenic	1.2	0.032	6.76E-09	6.76E-08	NA	1.23E-04	NA	NA	5.5E-04	30.2%
Vanadium	19.3	0.001	3.40E-09	3.40E-08	NA	7.00E-05	NA	NA	4.9E-04	26.6%
Total							1.7E-09	100.0%	1.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.1E-03	2.1E-04	1.3E-03	31.7%
Antimony	NA	1.7E-09	1.7E-09	9.6%	5.7E-04	5.7E-04	1.1E-03	28.2%
Arsenic	1.6E-08	NA	1.6E-08	90.4%	3.5E-04	5.5E-04	9.0E-04	22.2%
Vanadium	NA	NA	NA	NA	2.4E-04	4.9E-04	7.3E-04	17.9%
Total	1.6E-08	1.7E-09	1.8E-08	100.0%	2.2E-03	1.8E-03	4.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.8E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12832	1.1E-04	1.1E-03	NA	3.00E-01	NA	NA	3.8E-03	100.0%
					Total	NA	NA	3.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12832	0.001	2.26E-06	2.26E-05	NA	4.50E-02	NA	NA	5.0E-04	100.0%
Total						NA	NA	NA	5.0E-04	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	3.8E-03	5.0E-04	4.3E-03	100.0%
Total	NA	NA	NA	NA	3.8E-03	5.0E-04	4.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JUNE 30, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	3.8E-03	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	42.5%
Antimony	6.0	1.0E-06	2.9E-06	NA	4.00E-04	NA	NA	7.3E-03	29.1%
Arsenic	2.8	4.9E-07	1.4E-06	1.50E+00	3.00E-04	7.3E-07	100.0%	4.6E-03	18.1%
Vanadium	36.8	6.4E-06	1.8E-05	NA	7.00E-03	NA	NA	2.6E-03	10.2%
Total						7.3E-07	100.0%	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JUNE 30, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	2,300 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	250 Exposure frequency (events/year)
ED =	25 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	1.76E-04	4.93E-04	NA	1.00E-01	NA	NA	4.9E-03	9.9%
Antimony	6	0.001	4.82E-08	1.35E-07	NA	8.00E-06	NA	NA	1.7E-02	33.7%
Arsenic	2.8	0.032	7.20E-07	2.02E-06	3.66E+00	1.23E-04	2.6E-06	100.0%	1.6E-02	32.8%
Vanadium	36.8	0.001	2.96E-07	8.28E-07	NA	7.00E-05	NA	NA	1.2E-02	23.6%
Total							2.6E-06	100.0%	5.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JUNE 30, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.1E-02	4.9E-03	1.6E-02	20.8%
Antimony	NA	NA	NA	NA	7.3E-03	1.7E-02	2.4E-02	32.2%
Arsenic	7.3E-07	2.6E-06	3.4E-06	100.0%	4.6E-03	1.6E-02	2.1E-02	27.9%
Vanadium	NA	NA	NA	NA	2.6E-03	1.2E-02	1.4E-02	19.1%
Total	7.3E-07	2.6E-06	3.4E-06	100.0%	2.5E-02	5.0E-02	7.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.7E-07 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	2.1E-03	6.0E-03	NA	3.00E-02	NA	NA	2.0E-01	100.0%
Total						NA	NA	2.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 2,300 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 250 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	9.89E-04	2.77E-03	NA	2.00E-02	NA	NA	1.4E-01	100.0%
						Total	NA	NA	1.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	2.0E-01	1.4E-01	3.4E-01	100.0%
Total	NA	NA	NA	NA	2.0E-01	1.4E-01	3.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day****Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	2.3E-03	6.5E-03	NA	3.00E-01	NA	NA	2.2E-02	100.0%
					Total	NA	NA	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day****Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	1.06E-04	2.97E-04	NA	4.50E-02	NA	NA	6.6E-03	100.0%
Total							NA	NA	6.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.2E-02	6.6E-03	2.8E-02	100.0%
Total	NA	NA	NA	NA	2.2E-02	6.6E-03	2.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 6.3E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	7.7E-04	6.0E-03	NA	1.00E+00	NA	NA	6.0E-03	48.0%
Antimony	2.6	1.6E-07	1.3E-06	NA	4.00E-04	NA	NA	3.2E-03	25.5%
Arsenic	1.2	7.5E-08	5.9E-07	1.5	3.00E-04	1.1E-07	100.0%	2.0E-03	15.7%
Vanadium	19.3	1.2E-06	9.4E-06	NA	7.00E-03	NA	NA	1.3E-03	10.8%
Total						1.1E-07	100.0%	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 2,300 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 250 Exposure frequency (events/year)
 ED = : 9 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	0.001	7.07E-06	5.50E-05	NA	1.00E-01	NA	NA	5.5E-04	11.8%
Antimony	2.6	0.001	1.50E-09	1.17E-08	NA	8.00E-06	NA	NA	1.5E-03	31.4%
Arsenic	1.2	0.032	2.22E-08	1.73E-07	3.66	1.23E-04	8.1E-08	100.0%	1.4E-03	30.2%
Vanadium	19.3	0.001	1.12E-08	8.69E-08	NA	7.00E-05	NA	NA	1.2E-03	26.6%
Total							8.1E-08	100.0%	4.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.0E-03	5.5E-04	6.5E-03	38.1%
Antimony	NA	NA	NA	NA	3.2E-03	1.5E-03	4.6E-03	27.1%
Arsenic	1.1E-07	8.1E-08	1.9E-07	100.0%	2.0E-03	1.4E-03	3.4E-03	19.6%
Vanadium	NA	NA	NA	NA	1.3E-03	1.2E-03	2.6E-03	15.1%
Total	1.1E-07	8.1E-08	1.9E-07	100.0%	1.2E-02	4.7E-03	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	2.3E-04	6.4E-04	NA	1.00E+00	NA	NA	6.4E-04	42.5%
Antimony	6.0	6.3E-08	1.8E-07	NA	4.00E-04	NA	NA	4.4E-04	29.1%
Arsenic	2.8	2.9E-08	8.2E-08	1.50E+00	3.00E-04	4.4E-08	100.0%	2.7E-04	18.1%
Vanadium	36.8	3.9E-07	1.1E-06	NA	7.00E-03	NA	NA	1.5E-04	10.2%
Total						4.4E-08	100.0%	1.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	3.17E-05	8.87E-05	NA	1.00E-01	NA	NA	8.9E-04	9.9%
Antimony	6	0.001	8.68E-09	2.43E-08	NA	8.00E-06	NA	NA	3.0E-03	33.7%
Arsenic	2.8	0.032	1.30E-07	3.63E-07	3.66E+00	1.23E-04	4.7E-07	100.0%	3.0E-03	32.8%
Vanadium	36.8	0.001	5.32E-08	1.49E-07	NA	7.00E-05	NA	NA	2.1E-03	23.6%
Total							4.7E-07	100.0%	9.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.4E-04	8.9E-04	1.5E-03	14.5%
Antimony	NA	NA	NA	NA	4.4E-04	3.0E-03	3.5E-03	33.1%
Arsenic	4.4E-08	4.7E-07	5.2E-07	100.0%	2.7E-04	3.0E-03	3.2E-03	30.7%
Vanadium	NA	NA	NA	NA	1.5E-04	2.1E-03	2.3E-03	21.7%
Total	4.4E-08	4.7E-07	5.2E-07	100.0%	1.5E-03	9.0E-03	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	1.78E-04	4.98E-04	NA	2.00E-02	NA	NA	2.5E-02	100.0%
Total							NA	NA	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 1.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	1.3E-04	3.6E-04	NA	3.00E-02	NA	NA	1.2E-02	100.0%
					Total	NA	NA	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.2E-02	2.5E-02	3.7E-02	100.0%
Total	NA	NA	NA	NA	1.2E-02	2.5E-02	3.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	1.4E-04	3.9E-04	NA	3.00E-01	NA	NA	1.3E-03	100.0%
					Total	NA	NA	1.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	1.91E-05	5.35E-05	NA	4.50E-02	NA	NA	1.2E-03	100.0%
						Total	NA	NA	1.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.3E-03	1.2E-03	2.5E-03	100.0%
Total	NA	NA	NA	NA	1.3E-03	1.2E-03	2.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 8.1E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	1.8E-04	1.2E-02	NA	1.00E+00	NA	NA	1.2E-02	42.5%
Antimony	6.0	4.8E-08	3.4E-06	NA	4.00E-04	NA	NA	8.5E-03	29.1%
Arsenic	2.8	2.3E-08	1.6E-06	1.50E+00	3.00E-04	3.4E-08	100.0%	5.3E-03	18.1%
Vanadium	36.8	3.0E-07	2.1E-05	NA	7.00E-03	NA	NA	3.0E-03	10.2%
Total						3.4E-08	100.0%	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 1 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
 Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	2.11E-06	1.48E-04	NA	1.00E-01	NA	NA	1.5E-03	9.9%
Antimony	6	0.001	5.79E-10	4.05E-08	NA	8.00E-06	NA	NA	5.1E-03	33.7%
Arsenic	2.8	0.032	8.64E-09	6.05E-07	3.66	1.23E-04	3.2E-08	100.0%	4.9E-03	32.8%
Vanadium	36.8	0.001	3.55E-09	2.48E-07	NA	7.00E-05	NA	NA	3.5E-03	23.6%
Total							3.2E-08	100.0%	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.2E-02	1.5E-03	1.4E-02	31.4%
Antimony	NA	NA	NA	NA	8.5E-03	5.1E-03	1.4E-02	30.7%
Arsenic	3.4E-08	3.2E-08	6.5E-08	100.0%	5.3E-03	4.9E-03	1.0E-02	23.1%
Vanadium	NA	NA	NA	NA	3.0E-03	3.5E-03	6.5E-03	14.8%
Total	3.4E-08	3.2E-08	6.5E-08	100.0%	2.9E-02	1.5E-02	4.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	480 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	30 Exposure Frequency (days/year)
ED =	1 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	9.9E-05	6.9E-03	NA	3.00E-02	NA	NA	2.3E-01	100.0%
					Total	NA	NA	2.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
ABS =	Chemical Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	1 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	1.19E-05	8.30E-04	NA	2.00E-02	NA	NA	4.2E-02	100.0%
						Total	NA	NA	4.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	2.3E-01	4.2E-02	2.7E-01	100.0%
Total	NA	NA	NA	NA	2.3E-01	4.2E-02	2.7E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day****Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	1.1E-04	7.4E-03	NA	3.00E-01	NA	NA	2.5E-02	100.0%
					Total	NA	NA	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	1.27E-06	8.91E-05	NA	4.50E-02	NA	NA	2.0E-03	100.0%
Total							NA	NA	2.0E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.5E-02	2.0E-03	2.7E-02	100.0%
Total	NA	NA	NA	NA	2.5E-02	2.0E-03	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	1.0E-02	3.0E-02	NA	1.00E+00	NA	NA	3.0E-02	42.5%
Antimony	6.0	2.8E-06	8.2E-06	NA	4.00E-04	NA	NA	2.1E-02	29.1%
Arsenic	2.8	1.3E-06	3.8E-06	1.50E+00	3.00E-04	2.0E-06	100.0%	1.3E-02	18.1%
Vanadium	36.8	1.7E-05	5.0E-05	NA	7.00E-03	NA	NA	7.2E-03	10.2%
Total						2.0E-06	100.0%	7.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	5.97E-04	1.74E-03	NA	1.00E-01	NA	NA	1.7E-02	9.9%
Antimony	6	0.001	1.63E-07	4.77E-07	NA	8.00E-06	NA	NA	6.0E-02	33.7%
Arsenic	2.8	0.032	2.44E-06	7.12E-06	3.66	1.23E-04	8.9E-06	100.0%	5.8E-02	32.8%
Vanadium	36.8	0.001	1.00E-06	2.92E-06	NA	7.00E-05	NA	NA	4.2E-02	23.6%
Total							8.9E-06	100.0%	1.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	3.0E-02	1.7E-02	4.7E-02	19.2%
Antimony	NA	NA	NA	NA	2.1E-02	6.0E-02	8.0E-02	32.4%
Arsenic	2.0E-06	8.9E-06	1.1E-05	100.0%	1.3E-02	5.8E-02	7.1E-02	28.6%
Vanadium	NA	NA	NA	NA	7.2E-03	4.2E-02	4.9E-02	19.8%
Total	2.0E-06	8.9E-06	1.1E-05	100.0%	7.1E-02	1.8E-01	2.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 5.0E-08 kg-soil/kg-wt/day****Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	6.2E-04	2.2E-03	NA	3.00E-02	NA	NA	7.2E-02	100.0%
					Total	NA	NA	7.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	3.35E-03	9.77E-03	NA	2.00E-02	NA	NA	4.9E-01	100.0%
Total							NA	NA	4.9E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.6E-01	4.9E-01	1.1E+00	100.0%
Total	NA	NA	NA	NA	5.6E-01	4.9E-01	1.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	6.2E-03	1.8E-02	NA	3.00E-01	NA	NA	6.0E-02	100.0%
Total						NA	NA	6.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	3.60E-04	1.05E-03	NA	4.50E-02	NA	NA	2.3E-02	100.0%
Total							NA	NA	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	6.0E-02	2.3E-02	8.4E-02	100.0%
Total	NA	NA	NA	NA	6.0E-02	2.3E-02	8.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	5.6E-04	5.6E-03	NA	1.00E+00	NA	NA	5.6E-03	48.0%
Antimony	2.6	1.2E-07	1.2E-06	NA	4.00E-04	NA	NA	3.0E-03	25.5%
Arsenic	1.2	5.5E-08	5.5E-07	1.50E+00	3.00E-04	8.2E-08	100.0%	1.8E-03	15.7%
Vanadium	19.3	8.8E-07	8.8E-06	NA	7.00E-03	NA	NA	1.3E-03	10.8%
Total						8.2E-08	100.0%	1.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,000 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : 7 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	0.001	1.12E-05	1.12E-04	NA	1.00E-01	NA	NA	1.1E-03	11.8%
Antimony	2.6	0.001	2.38E-09	2.38E-08	NA	8.00E-06	NA	NA	3.0E-03	31.4%
Arsenic	1.2	0.032	3.52E-08	3.52E-07	3.66	1.23E-04	1.3E-07	100.0%	2.9E-03	30.2%
Vanadium	19.3	0.001	1.77E-08	1.77E-07	NA	7.00E-05	NA	NA	2.5E-03	26.6%
Total							1.3E-07	100.0%	9.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.6E-03	1.1E-03	6.7E-03	31.8%
Antimony	NA	NA	NA	NA	3.0E-03	3.0E-03	6.0E-03	28.2%
Arsenic	8.2E-08	1.3E-07	2.1E-07	100.0%	1.8E-03	2.9E-03	4.7E-03	22.2%
Vanadium	NA	NA	NA	NA	1.3E-03	2.5E-03	3.8E-03	17.9%
Total	8.2E-08	1.3E-07	2.1E-07	100.0%	1.2E-02	9.5E-03	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2872	1.3E-04	1.3E-03	NA	3.00E-02	NA	NA	4.4E-02	100.0%
					Total	NA	NA	4.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2872	0.01	2.63E-05	2.63E-04	NA	2.00E-02	NA	NA	1.3E-02	100.0%
Total							NA	NA	1.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.4E-02	1.3E-02	5.7E-02	100.0%
Total	NA	NA	NA	NA	4.4E-02	1.3E-02	5.7E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 4.6E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12832	5.9E-04	5.9E-03	NA	3.00E-01	NA	NA	2.0E-02	100.0%
					Total	NA	NA	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	7 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	12832	0.001	1.18E-05	1.18E-04	NA	4.50E-02	NA	NA	2.6E-03	100.0%
Total							NA	NA	2.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.0E-02	2.6E-03	2.2E-02	100.0%
Total	NA	NA	NA	NA	2.0E-02	2.6E-03	2.2E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:	Cs = :	Mean concentration in soil (mg/kg)
	IR = :	200 Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06 Conversion Factor (kg/mg)
	FI = :	1 Fraction from contaminated source (unitless)
	EF = :	350 Exposure Frequency (days/year)
	ED = :	6 Exposure Duration (years)
	BW = :	15 Body Weight (kg)
	ATc = :	25,550 Averaging time for carcinogenic exposures (days)
	ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake =: 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	2.4E-02	2.8E-01	NA	1.00E+00	NA	NA	2.8E-01	42.5%
Antimony	6.0	6.6E-06	7.7E-05	NA	4.00E-04	NA	NA	1.9E-01	29.1%
Arsenic	2.8	3.1E-06	3.6E-05	1.50E+00	3.00E-04	4.6E-06	100.0%	1.2E-01	18.1%
Vanadium	36.8	4.0E-05	4.7E-04	NA	7.00E-03	NA	NA	6.7E-02	10.2%
					Total	4.6E-06	100.0%	6.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA _{soil/adj} = :	766 Skin surface available for contact (cm ² -year/kg)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
AT _c = :	25,550 Averaging time for carcinogenic exposures (days)
AT _n = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	21900	0.001	2.30E-04	2.68E-03	NA	1.00E-01	NA	NA	2.7E-02	9.9%
Antimony	6	0.001	6.30E-08	7.35E-07	NA	8.00E-06	NA	NA	9.2E-02	33.7%
Arsenic	2.8	0.032	9.40E-07	1.10E-05	3.66	1.23E-04	3.4E-06	100.0%	8.9E-02	32.8%
Vanadium	36.8	0.001	3.86E-07	4.51E-06	NA	7.00E-05	NA	NA	6.4E-02	23.6%
Total							3.4E-06	100.0%	2.7E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 2, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.8E-01	2.7E-02	3.1E-01	33.0%
Antimony	NA	NA	NA	NA	1.9E-01	9.2E-02	2.8E-01	30.5%
Arsenic	4.6E-06	3.4E-06	8.0E-06	100.0%	1.2E-01	8.9E-02	2.1E-01	22.4%
Vanadium	NA	NA	NA	NA	6.7E-02	6.4E-02	1.3E-01	14.1%
Total	4.6E-06	3.4E-06	8.0E-06	100.0%	6.6E-01	2.7E-01	9.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	1.3E-02	1.6E-01	NA	3.00E-02	NA	NA	5.2E+00	100.0%
Total						NA	NA	5.2E+00	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	12300	0.01	1.29E-03	1.51E-02	NA	2.00E-02	NA	NA	7.5E-01	100.0%
						Total	NA	NA	7.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	5.2E+00	7.5E-01	6.0E+00	100.0%
Total	NA	NA	NA	NA	5.2E+00	7.5E-01	6.0E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	1.4E-02	1.7E-01	NA	3.00E-01	NA	NA	5.6E-01	100.0%
					Total	NA	NA	5.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: $Cs =$: Mean concentration in soil (mg/kg)
 $CF =$: 1.0E-06 Conversion factor (kg/mg)
 $SA =$: 766 Skin surface available for contact (cm²/event)
 $AF =$: 1.0 Soil to skin adherence factor (mg/cm²)
 $ABS =$: Absorption factor (unitless)
 $EF =$: 350 Exposure frequency (events/year)
 $ED =$: Exposure duration (years)
 $BW =$: Body weight (kg)
 $ATc =$: 25,550 Averaging time for carcinogenic exposures (days)
 $ATn =$: 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	13200	0.001	1.39E-04	1.62E-03	NA	4.50E-02	NA	NA	3.6E-02	100.0%
Total							NA	NA	3.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	5.6E-01	3.6E-02	6.0E-01	100.0%
Total	NA	NA	NA	NA	5.6E-01	3.6E-02	6.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 1.2E-07 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	1.5E-03	5.2E-02	NA	1.00E+00	NA	NA	5.2E-02	48.0%
Antimony	2.6	3.2E-07	1.1E-05	NA	4.00E-04	NA	NA	2.8E-02	25.5%
Arsenic	1.2	1.5E-07	5.1E-06	1.50E+00	3.00E-04	2.2E-07	100.0%	1.7E-02	15.7%
Vanadium	19.3	2.4E-06	8.2E-05	NA	7.00E-03	NA	NA	1.2E-02	10.8%
Total						2.2E-07	100.0%	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA adj = :	663 Skin surface available for contact (cm ² ·year/kg)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	12220	0.001	1.48E-05	5.19E-04	NA	1.00E-01	NA	NA	5.2E-03	11.8%
Antimony	2.6	0.001	3.16E-09	1.11E-07	NA	8.00E-06	NA	NA	1.4E-02	31.4%
Arsenic	1.2	0.032	4.66E-08	1.63E-06	3.66	1.23E-04	1.7E-07	100.0%	1.3E-02	30.2%
Vanadium	19.3	0.001	2.34E-08	8.20E-07	NA	7.00E-05	NA	NA	1.2E-02	26.6%
Total							1.7E-07	100.0%	4.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.2E-02	5.2E-03	5.7E-02	37.6%
Antimony	NA	NA	NA	NA	2.8E-02	1.4E-02	4.2E-02	27.2%
Arsenic	2.2E-07	1.7E-07	3.9E-07	100.0%	1.7E-02	1.3E-02	3.0E-02	19.9%
Vanadium	NA	NA	NA	NA	1.2E-02	1.2E-02	2.4E-02	15.4%
Total	2.2E-07	1.7E-07	3.9E-07	100.0%	1.1E-01	4.4E-02	1.5E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2872	3.5E-04	1.2E-02	NA	3.00E-02	NA	NA	4.1E-01	100.0%
					Total	NA	NA	4.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	663 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2872	0.01	1.74E-04	1.22E-03	NA	4.50E-02	NA	NA	2.7E-02	100.0%
Total						NA	NA	NA	2.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.1E-01	2.7E-02	4.4E-01	100.0%
Total	NA	NA	NA	NA	4.1E-01	2.7E-02	4.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7202	8.8E-04	3.1E-02	NA	3.00E-01	NA	NA	1.0E-01	100.0%
					Total	NA	NA	1.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	663 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	234 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

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D9-301

CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7202	0.001	4.37E-05	3.06E-04	NA	4.50E-02	NA	NA	6.8E-03	100.0%
Total							NA	NA	6.8E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 32****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.0E-01	6.8E-03	1.1E-01	100.0%
Total	NA	NA	NA	NA	1.0E-01	6.8E-03	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day****Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	7.8E-04	5.5E-03	NA	1.00E+00	NA	NA	5.5E-03	31.2%
Arsenic	11.5	4.5E-07	3.2E-06	1.50E+00	3.00E-04	6.8E-07	100.0%	1.1E-02	60.2%
Vanadium	38.4	1.5E-06	1.1E-05	NA	7.00E-03	NA	NA	1.5E-03	8.6%
Total						6.8E-07	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	3.55E-05	2.49E-04	NA	1.00E-01	NA	NA	2.5E-03	5.3%
Arsenic	11.5	0.032	6.57E-07	4.60E-06	3.66E+00	1.23E-04	2.4E-06	100.0%	3.7E-02	80.0%
Vanadium	38.4	0.001	6.85E-08	4.80E-07	NA	7.00E-05	NA	NA	6.9E-03	14.7%
Total							2.4E-06	100.0%	4.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.5E-03	2.5E-03	7.9E-03	12.4%
Arsenic	6.8E-07	2.4E-06	3.1E-06	100.0%	1.1E-02	3.7E-02	4.8E-02	74.6%
Vanadium	NA	NA	NA	NA	1.5E-03	6.9E-03	8.4E-03	13.0%
Total	6.8E-07	2.4E-06	3.1E-06	100.0%	1.7E-02	4.7E-02	6.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	9.0E-05	6.3E-04	NA	3.00E-02	NA	NA	2.1E-02	100.0%
					Total	NA	NA	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	1,013 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

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CTO-0028

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	4.10E-05	2.87E-04	NA	2.00E-02	NA	NA	1.4E-02	100.0%
						Total	NA	NA	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	2.1E-02	1.4E-02	3.5E-02	100.0%
Total	NA	NA	NA	NA	2.1E-02	1.4E-02	3.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	10 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 3.9E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.7E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	5.5E-04	3.8E-03	NA	3.00E-01	NA	NA	1.3E-02	100.0%
					Total	NA	NA	1.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 1,013 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 3,650 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	2.51E-05	1.75E-04	NA	4.50E-02	NA	NA	3.9E-03	100.0%
						Total	NA	NA	3.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.3E-02	3.9E-03	1.7E-02	100.0%
Total	NA	NA	NA	NA	1.3E-02	3.9E-03	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	45 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 3.9E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.4E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	5.3E-05	1.9E-03	NA	1.00E+00	NA	NA	1.9E-03	46.9%
Arsenic	3.7	1.4E-08	5.1E-07	1.50E+00	3.00E-04	2.2E-08	100.0%	1.7E-03	42.7%
Vanadium	21	8.2E-08	2.9E-06	NA	7.00E-03	NA	NA	4.1E-04	10.4%
Total						2.2E-08	100.0%	4.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 1,013 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 3.6E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.2E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	4.84E-06	1.69E-04	NA	1.00E-01	NA	NA	1.7E-03	9.7%
Arsenic	3.7	0.032	4.22E-08	1.48E-06	3.66	1.23E-04	1.5E-07	100.0%	1.2E-02	68.8%
Vanadium	21	0.001	7.49E-09	2.62E-07	NA	7.00E-05	NA	NA	3.7E-03	21.5%
Total							1.5E-07	100.0%	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - OLDER CHILD - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.9E-03	1.7E-03	3.6E-03	16.6%
Arsenic	2.2E-08	1.5E-07	1.8E-07	100.0%	1.7E-03	1.2E-02	1.4E-02	64.0%
Vanadium	NA	NA	NA	NA	4.1E-04	3.7E-03	4.2E-03	19.4%
Total	2.2E-08	1.5E-07	1.8E-07	100.0%	4.0E-03	1.7E-02	2.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 7, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	100 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	45 Exposure Frequency (days/year)
ED =	20 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =** 5.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake =** 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	1.0E-03	3.5E-03	NA	1.00E+00	NA	NA	3.5E-03	31.2%
Arsenic	11.5	5.8E-07	2.0E-06	1.5	3.00E-04	8.7E-07	100.0%	6.8E-03	60.2%
Vanadium	38.4	1.9E-06	6.8E-06	NA	7.00E-03	NA	NA	9.7E-04	8.6%
					Total	8.7E-07	100.0%	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 7, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	5.76E-05	2.02E-04	NA	1.00E-01	NA	NA	2.0E-03	5.3%
Arsenic	11.5	0.032	1.06E-06	3.73E-06	3.66	1.23E-04	3.9E-06	100.0%	3.0E-02	80.0%
Vanadium	38.4	0.001	1.11E-07	3.89E-07	NA	7.00E-05	NA	NA	5.6E-03	14.7%
Total							3.9E-06	100.0%	3.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 7, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	3.5E-03	2.0E-03	5.5E-03	11.2%
Arsenic	8.7E-07	3.9E-06	4.8E-06	100.0%	6.8E-03	3.0E-02	3.7E-02	75.5%
Vanadium	NA	NA	NA	NA	9.7E-04	5.6E-03	6.5E-03	13.3%
Total	8.7E-07	3.9E-06	4.8E-06	100.0%	1.1E-02	3.8E-02	4.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 5.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	1.2E-04	4.1E-04	NA	3.00E-02	NA	NA	1.4E-02	100.0%
Total						NA	NA	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : 20 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	6.66E-05	2.33E-04	NA	2.00E-02	NA	NA	1.2E-02	100.0%
						Total	NA	NA	1.2E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.4E-02	1.2E-02	2.5E-02	100.0%
Total	NA	NA	NA	NA	1.4E-02	1.2E-02	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 9, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	20 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 5.0E-08 kg-soil/kg-wt/day**Chronic Daily Intake = :** 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	7.1E-04	2.5E-03	NA	3.00E-01	NA	NA	8.2E-03	100.0%
Total						NA	NA	8.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	45 Exposure frequency (events/year)
ED = :	20 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	7,300 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.9E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.0E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 9, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	4.07E-05	1.42E-04	NA	4.50E-02	NA	NA	3.2E-03	100.0%
Total							NA	NA	3.2E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 9, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	8.2E-03	3.2E-03	1.1E-02	100.0%
Total	NA	NA	NA	NA	8.2E-03	3.2E-03	1.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	45 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 8.8E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 8.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	1.2E-04	1.2E-03	NA	1.00E+00	NA	NA	1.2E-03	46.9%
Arsenic	3.7	3.3E-08	3.3E-07	1.5	3.00E-04	4.9E-08	100.0%	1.1E-03	42.7%
Vanadium	21	1.8E-07	1.8E-06	NA	7.00E-03	NA	NA	2.6E-04	10.4%
					Total	4.9E-08	100.0%	2.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,000 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 45 Exposure frequency (events/year)
 ED = : 7 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.8E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	2.39E-06	2.39E-05	NA	1.00E-01	NA	NA	2.4E-04	9.7%
Arsenic	3.7	0.032	2.09E-08	2.09E-07	3.66	1.23E-04	7.6E-08	100.0%	1.7E-03	68.8%
Vanadium	21	0.001	3.70E-09	3.70E-08	NA	7.00E-05	NA	NA	5.3E-04	21.5%
Total							7.6E-08	100.0%	2.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: TRESPASSER - ADULT - CENTRAL TENDENCY EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 18, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.2E-03	2.4E-04	1.4E-03	28.6%
Arsenic	4.9E-08	7.6E-08	1.3E-07	100.0%	1.1E-03	1.7E-03	2.8E-03	55.5%
Vanadium	NA	NA	NA	NA	2.6E-04	5.3E-04	7.9E-04	15.8%
Total	4.9E-08	7.6E-08	1.3E-07	100.0%	2.5E-03	2.5E-03	5.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JUNE 30, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 1.7E-07 kg-soil/kg-wt/day**Chronic Daily Intake = :** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	3.5E-03	9.7E-03	NA	1.00E+00	NA	NA	9.7E-03	31.2%
Arsenic	11.5	2.0E-06	5.6E-06	1.50E+00	3.00E-04	3.0E-06	100.0%	1.9E-02	60.2%
Vanadium	38.4	6.7E-06	1.9E-05	NA	7.00E-03	NA	NA	2.7E-03	8.6%
Total						3.0E-06	100.0%	3.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JUNE 30, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JUNE 30, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	1.60E-04	4.48E-04	NA	1.00E-01	NA	NA	4.5E-03	5.3%
Arsenic	11.5	0.032	2.96E-06	8.28E-06	3.66E+00	1.23E-04	1.1E-05	100.0%	6.7E-02	80.0%
Vanadium	38.4	0.001	3.09E-07	8.64E-07	NA	7.00E-05	NA	NA	1.2E-02	14.7%
Total							1.1E-05	100.0%	8.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JUNE 30, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	9.7E-03	4.5E-03	1.4E-02	12.3%
Arsenic	3.0E-06	1.1E-05	1.4E-05	100.0%	1.9E-02	6.7E-02	8.6E-02	74.6%
Vanadium	NA	NA	NA	NA	2.7E-03	1.2E-02	1.5E-02	13.0%
Total	3.0E-06	1.1E-05	1.4E-05	100.0%	3.1E-02	8.4E-02	1.2E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	4.0E-04	1.1E-03	NA	3.00E-02	NA	NA	3.8E-02	100.0%
					Total	NA	NA	3.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	1.85E-04	5.18E-04	NA	2.00E-02	NA	NA	2.6E-02	100.0%
						Total	NA	NA	2.6E-02	100.0%

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Rev. 1
09/27/99

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	3.8E-02	2.6E-02	6.3E-02	100.0%
Total	NA	NA	NA	NA	3.8E-02	2.6E-02	6.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	2.5E-03	6.9E-03	NA	3.00E-01	NA	NA	2.3E-02	100.0%
Total						NA	NA	2.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 20, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 8.0E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: AUGUST 20, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	1.13E-04	3.16E-04	NA	4.50E-02	NA	NA	7.0E-03	100.0%
Total						NA	NA	NA	7.0E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 20, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.3E-02	7.0E-03	3.0E-02	100.0%
Total	NA	NA	NA	NA	2.3E-02	7.0E-03	3.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	250 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 6.3E-08 kg-soil/kg-wt/day**Chronic Daily Intake =:** 4.9E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	8.5E-04	6.6E-03	NA	1.00E+00	NA	NA	6.6E-03	46.9%
Arsenic	3.7	2.3E-07	1.8E-06	1.5	3.00E-04	3.5E-07	100.0%	6.0E-03	42.7%
Vanadium	21	1.3E-06	1.0E-05	NA	7.00E-03	NA	NA	1.5E-03	10.4%
Total						3.5E-07	100.0%	1.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	2,300 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	250 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 5.8E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: AUGUST 18, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	7.85E-06	6.11E-05	NA	1.00E-01	NA	NA	6.1E-04	9.7%
Arsenic	3.7	0.032	6.85E-08	5.33E-07	3.66	1.23E-04	2.5E-07	100.0%	4.3E-03	68.8%
Vanadium	21	0.001	1.22E-08	9.45E-08	NA	7.00E-05	NA	NA	1.4E-03	21.5%
Total							2.5E-07	100.0%	6.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: OCCUPATIONAL WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.6E-03	6.1E-04	7.2E-03	35.5%
Arsenic	3.5E-07	2.5E-07	6.0E-07	100.0%	6.0E-03	4.3E-03	1.0E-02	50.7%
Vanadium	NA	NA	NA	NA	1.5E-03	1.4E-03	2.8E-03	13.8%
Total	3.5E-07	2.5E-07	6.0E-07	100.0%	1.4E-02	6.3E-03	2.0E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	2.1E-04	5.8E-04	NA	1.00E+00	NA	NA	5.8E-04	31.2%
Arsenic	11.5	1.2E-07	3.4E-07	1.50E+00	3.00E-04	1.8E-07	100.0%	1.1E-03	60.2%
Vanadium	38.4	4.0E-07	1.1E-06	NA	7.00E-03	NA	NA	1.6E-04	8.6%
Total						1.8E-07	100.0%	1.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 0.6 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	2.88E-05	8.06E-05	NA	1.00E-01	NA	NA	8.1E-04	5.3%
Arsenic	11.5	0.032	5.32E-07	1.49E-06	3.66E+00	1.23E-04	1.9E-06	100.0%	1.2E-02	80.0%
Vanadium	38.4	0.001	5.56E-08	1.56E-07	NA	7.00E-05	NA	NA	2.2E-03	14.7%
Total							1.9E-06	100.0%	1.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.8E-04	8.1E-04	1.4E-03	8.2%
Arsenic	1.8E-07	1.9E-06	2.1E-06	100.0%	1.1E-03	1.2E-02	1.3E-02	77.8%
Vanadium	NA	NA	NA	NA	1.6E-04	2.2E-03	2.4E-03	14.0%
Total	1.8E-07	1.9E-06	2.1E-06	100.0%	1.9E-03	1.5E-02	1.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	2.4E-05	6.8E-05	NA	3.00E-02	NA	NA	2.3E-03	100.0%
					Total	NA	NA	2.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $(Cs \times CF \times SA \times AF \times ABS \times EF \times ED) / (BW \times AT)$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,750 Skin surface available for contact (cm²/event)
 AF = : 0.6 Soil to skin adherence factor (mg/cm²)
 Chemical
 ABS = : Specific Absorption factor (unitless)
 EF = : 30 Exposure frequency (events/year)
 ED = : 25 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	3.33E-05	9.32E-05	NA	2.00E-02	NA	NA	4.7E-03	100.0%
Total						NA	NA	NA	4.7E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	2.3E-03	4.7E-03	6.9E-03	100.0%
Total	NA	NA	NA	NA	2.3E-03	4.7E-03	6.9E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 8, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	25 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.0E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 2.9E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	1.5E-04	4.1E-04	NA	3.00E-01	NA	NA	1.4E-03	100.0%
					Total	NA	NA	1.4E-03	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	0.6 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical
	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	25 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	9,125 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.1E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 8, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	2.03E-05	5.69E-05	NA	4.50E-02	NA	NA	1.3E-03	100.0%
Total						NA	NA	NA	1.3E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 8, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.4E-03	1.3E-03	2.6E-03	100.0%
Total	NA	NA	NA	NA	1.4E-03	1.3E-03	2.6E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	0.5 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	9 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake = :** 3.8E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 2.9E-08 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	5.1E-05	4.0E-04	NA	1.00E+00	NA	NA	4.0E-04	46.9%
Arsenic	3.7	1.4E-08	1.1E-07	1.50E+00	3.00E-04	2.1E-08	100.0%	3.6E-04	42.7%
Vanadium	21	7.9E-08	6.2E-07	NA	7.00E-03	NA	NA	8.8E-05	10.4%
					Total	2.1E-08	100.0%	8.5E-04	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: AUGUST 18, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,000 Skin surface available for contact (cm ² /event)
AF = :	0.2 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	9 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	3,285 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.5E-07 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	2.05E-06	1.59E-05	NA	1.00E-01	NA	NA	1.6E-04	9.7%
Arsenic	3.7	0.032	1.79E-08	1.39E-07	3.66	1.23E-04	6.5E-08	100.0%	1.1E-03	68.8%
Vanadium	21	0.001	3.17E-09	2.47E-08	NA	7.00E-05	NA	NA	3.5E-04	21.5%
Total							6.5E-08	100.0%	1.6E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: SITE MAINTENANCE WORKER - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: AUGUST 18, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	4.0E-04	1.6E-04	5.6E-04	22.4%
Arsenic	2.1E-08	6.5E-08	8.6E-08	100.0%	3.6E-04	1.1E-03	1.5E-03	59.9%
Vanadium	NA	NA	NA	NA	8.8E-05	3.5E-04	4.4E-04	17.7%
Total	2.1E-08	6.5E-08	8.6E-08	100.0%	8.5E-04	1.6E-03	2.5E-03	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose**Lifetime Chronic Daily Intake =:** 8.1E-09 kg-soil/kg-wt/day**Chronic Daily Intake = :** 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	1.6E-04	1.1E-02	NA	1.00E+00	NA	NA	1.1E-02	31.2%
Arsenic	11.5	9.3E-08	6.5E-06	1.50E+00	3.00E-04	1.4E-07	100.0%	2.2E-02	60.2%
Vanadium	38.4	3.1E-07	2.2E-05	NA	7.00E-03	NA	NA	3.1E-03	8.6%
					Total	1.4E-07	100.0%	3.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,750 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS =	Specific Absorption factor (unitless)
EF =	30 Exposure frequency (events/year)
ED =	1 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	1.92E-06	1.34E-04	NA	1.00E-01	NA	NA	1.3E-03	5.3%
Arsenic	11.5	0.032	3.55E-08	2.48E-06	3.66	1.23E-04	1.3E-07	100.0%	2.0E-02	80.0%
Vanadium	38.4	0.001	3.70E-09	2.59E-07	NA	7.00E-05	NA	NA	3.7E-03	14.7%
Total							1.3E-07	100.0%	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURE
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	1.1E-02	1.3E-03	1.3E-02	20.5%
Arsenic	1.4E-07	1.3E-07	2.7E-07	100.0%	2.2E-02	2.0E-02	4.2E-02	68.4%
Vanadium	NA	NA	NA	NA	3.1E-03	3.7E-03	6.8E-03	11.1%
Total	1.4E-07	1.3E-07	2.7E-07	100.0%	3.6E-02	2.5E-02	6.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	1.9E-05	1.3E-03	NA	3.00E-02	NA	NA	4.3E-02	100.0%
					Total	NA	NA	4.3E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Chemical Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	2.22E-06	1.55E-04	NA	2.00E-02	NA	NA	7.8E-03	100.0%
Total							NA	NA	7.8E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	4.3E-02	7.8E-03	5.1E-02	100.0%
Total	NA	NA	NA	NA	4.3E-02	7.8E-03	5.1E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = (C \times IR \times CF \times FI \times EF \times ED) / (BW \times AT)$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	480 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	30 Exposure Frequency (days/year)
ED = :	1 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 8.1E-09 kg-soil/kg-wt/day

Chronic Daily Intake = : 5.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	1.1E-04	7.9E-03	NA	3.00E-01	NA	NA	2.6E-02	100.0%
Total						NA	NA	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Absorbed Dose} = (\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,750 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
	Chemical
ABS = :	Specific Absorption factor (unitless)
EF = :	30 Exposure frequency (events/year)
ED = :	1 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	365 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 6.8E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	1.36E-06	9.49E-05	NA	4.50E-02	NA	NA	2.1E-03	100.0%
						Total	NA	NA	2.1E-03	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: CONSTRUCTION WORKER - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	2.6E-02	2.1E-03	2.9E-02	100.0%
Total	NA	NA	NA	NA	2.6E-02	2.1E-03	2.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	9.3E-03	2.7E-02	NA	1.00E+00	NA	NA	2.7E-02	31.2%
Arsenic	11.5	5.4E-06	1.6E-05	1.50E+00	3.00E-04	8.1E-06	100.0%	5.3E-02	60.2%
Vanadium	38.4	1.8E-05	5.3E-05	NA	7.00E-03	NA	NA	7.5E-03	8.6%
					Total	8.1E-06	100.0%	8.7E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 2, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 5,800 Skin surface available for contact (cm²/event)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : 24 Exposure duration (years)
 BW = : 70 Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	5.42E-04	1.58E-03	NA	1.00E-01	NA	NA	1.6E-02	5.3%
Arsenic	11.5	0.032	1.00E-05	2.92E-05	3.66	1.23E-04	3.7E-05	100.0%	2.4E-01	80.0%
Vanadium	38.4	0.001	1.05E-06	3.05E-06	NA	7.00E-05	NA	NA	4.4E-02	14.7%
Total							3.7E-05	100.0%	3.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.7E-02	1.6E-02	4.3E-02	11.2%
Arsenic	8.1E-06	3.7E-05	4.5E-05	100.0%	5.3E-02	2.4E-01	2.9E-01	75.5%
Vanadium	NA	NA	NA	NA	7.5E-03	4.4E-02	5.1E-02	13.3%
Total	8.1E-06	3.7E-05	4.5E-05	100.0%	8.7E-02	3.0E-01	3.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs =	Mean concentration in soil (mg/kg)
IR =	100 Soil Ingestion Rate (mg/day)
CF =	1.0E-06 Conversion Factor (kg/mg)
FI =	1 Fraction from contaminated source (unitless)
EF =	350 Exposure Frequency (days/year)
ED =	24 Exposure Duration (years)
BW =	70 Body Weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	1.1E-03	3.2E-03	NA	3.00E-02	NA	NA	1.1E-01	100.0%
Total						NA	NA	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	5,800 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	24 Exposure duration (years)
BW = :	70 Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = : 7.9E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	6.27E-04	1.83E-03	NA	2.00E-02	NA	NA	9.1E-02	100.0%
Total						NA	NA	NA	9.1E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	1.1E-01	9.1E-02	2.0E-01	100.0%
Total	NA	NA	NA	NA	1.1E-01	9.1E-02	2.0E-01	100.0%

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RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	24 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.7E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.4E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	6.6E-03	1.9E-02	NA	3.00E-01	NA	NA	6.4E-02	100.0%
					Total	NA	NA	6.4E-02	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,800 Skin surface available for contact (cm ² /event)
AF =	1.0 Soil to skin adherence factor (mg/cm ²)
ABS =	Absorption factor (unitless)
EF =	350 Exposure frequency (events/year)
ED =	24 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	8,760 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 2.7E-05 kg-soil/kg-wt/day

Chronic Daily Intake = 7.9E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	3.83E-04	1.12E-03	NA	4.50E-02	NA	NA	2.5E-02	100.0%
						Total	NA	NA	2.5E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	6.4E-02	2.5E-02	8.9E-02	100.0%
Total	NA	NA	NA	NA	6.4E-02	2.5E-02	8.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.

EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.

ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	50 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	7 Exposure Duration (years)
BW = :	70 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 4.6E-08 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	6.2E-04	6.2E-03	NA	1.00E+00	NA	NA	6.2E-03	46.9%
Arsenic	3.7	1.7E-07	1.7E-06	1.50E+00	3.00E-04	2.5E-07	100.0%	5.6E-03	42.7%
Vanadium	21	9.6E-07	9.6E-06	NA	7.00E-03	NA	NA	1.4E-03	10.4%
					Total	2.5E-07	100.0%	1.3E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs =	Mean concentration in soil (mg/kg)
CF =	1.0E-06 Conversion factor (kg/mg)
SA =	5,000 Skin surface available for contact (cm ² /event)
AF =	0.2 Soil to skin adherence factor (mg/cm ²)
ABS =	Absorption factor (unitless)
EF =	234 Exposure frequency (events/year)
ED =	7 Exposure duration (years)
BW =	70 Body weight (kg)
ATc =	25,550 Averaging time for carcinogenic exposures (days)
ATn =	2,555 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 9.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = 9.2E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	1.24E-05	1.24E-04	NA	1.00E-01	NA	NA	1.2E-03	9.7%
Arsenic	3.7	0.032	1.08E-07	1.08E-06	3.66	1.23E-04	4.0E-07	100.0%	8.8E-03	68.8%
Vanadium	21	0.001	1.92E-08	1.92E-07	NA	7.00E-05	NA	NA	2.7E-03	21.5%
Total							4.0E-07	100.0%	1.3E-02	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE ADULT RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	6.2E-03	1.2E-03	7.5E-03	28.6%
Arsenic	2.5E-07	4.0E-07	6.5E-07	100.0%	5.6E-03	8.8E-03	1.4E-02	55.5%
Vanadium	NA	NA	NA	NA	1.4E-03	2.7E-03	4.1E-03	15.8%
Total	2.5E-07	4.0E-07	6.5E-07	100.0%	1.3E-02	1.3E-02	2.6E-02	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 2, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	2.2E-02	2.5E-01	NA	1.00E+00	NA	NA	2.5E-01	31.2%
Arsenic	11.5	1.3E-05	1.5E-04	1.50E+00	3.00E-04	1.9E-05	100.0%	4.9E-01	60.2%
Vanadium	38.4	4.2E-05	4.9E-04	NA	7.00E-03	NA	NA	7.0E-02	8.6%
					Total	1.9E-05	100.0%	8.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 2, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SAsoil/adj = 766 Skin surface available for contact (cm²-year/kg)
 AF = : 1.0 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 350 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 2, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	19900	0.001	2.09E-04	2.44E-03	NA	1.00E-01	NA	NA	2.4E-02	5.3%
Arsenic	11.5	0.032	3.86E-06	4.51E-05	3.66	1.23E-04	1.4E-05	100.0%	3.7E-01	80.0%
Vanadium	38.4	0.001	4.03E-07	4.70E-06	NA	7.00E-05	NA	NA	6.7E-02	14.7%
Total							1.4E-05	100.0%	4.6E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 2, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	2.5E-01	2.4E-02	2.8E-01	21.9%
Arsenic	1.9E-05	1.4E-05	3.3E-05	100.0%	4.9E-01	3.7E-01	8.6E-01	67.3%
Vanadium	NA	NA	NA	NA	7.0E-02	6.7E-02	1.4E-01	10.8%
Total	1.9E-05	1.4E-05	3.3E-05	100.0%	8.1E-01	4.6E-01	1.3E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	2.5E-03	2.9E-02	NA	3.00E-02	NA	NA	9.8E-01	100.0%
					Total	NA	NA	9.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
 Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	2.41E-04	2.82E-03	NA	2.00E-02	NA	NA	1.4E-01	100.0%
Total							NA	NA	1.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	9.8E-01	1.4E-01	1.1E+00	100.0%
Total	NA	NA	NA	NA	9.8E-01	1.4E-01	1.1E+00	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	200 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	350 Exposure Frequency (days/year)
ED = :	6 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

Chronic Daily Intake = : 1.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	1.5E-02	1.8E-01	NA	3.00E-01	NA	NA	6.0E-01	100.0%
					Total	NA	NA	6.0E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL
SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{\text{Cs} \times \text{CF} \times \text{SA} \times \text{AF} \times \text{ABS} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where:

Cs = :	Mean concentration in soil (mg/kg)
CF = :	1.0E-06 Conversion factor (kg/mg)
SA = :	766 Skin surface available for contact (cm ² /event)
AF = :	1.0 Soil to skin adherence factor (mg/cm ²)
ABS = :	Absorption factor (unitless)
EF = :	350 Exposure frequency (events/year)
ED = :	Exposure duration (years)
BW = :	Body weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	2,190 Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = 1.0E-05 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.2E-04 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs 14050	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	14050	0.001	1.47E-04	1.72E-03	NA	4.50E-02	NA	NA	3.8E-02	100.0%
Total							NA	NA	3.8E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - REASONABLE MAXIMUM EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	6.0E-01	3.8E-02	6.4E-01	100.0%
Total	NA	NA	NA	NA	6.0E-01	3.8E-02	6.4E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	1.7E-03	5.8E-02	NA	1.00E+00	NA	NA	5.8E-02	46.9%
Arsenic	3.7	4.5E-07	1.6E-05	1.50E+00	3.00E-04	6.8E-07	100.0%	5.3E-02	42.7%
Vanadium	21	2.6E-06	9.0E-05	NA	7.00E-03	NA	NA	1.3E-02	10.4%
Total						6.8E-07	100.0%	1.2E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 10, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: Absorbed Dose = $\frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA adj = : 663 Skin surface available for contact (cm²·year/kg)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = 4.3E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 10, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Aluminum	13570	0.001	1.65E-05	5.77E-04	NA	1.00E-01	NA	NA	5.8E-03	9.7%
Arsenic	3.7	0.032	1.44E-07	5.03E-06	3.66	1.23E-04	5.3E-07	100.0%	4.1E-02	68.8%
Vanadium	21	0.001	2.55E-08	8.93E-07	NA	7.00E-05	NA	NA	1.3E-02	21.5%
Total							5.3E-07	100.0%	5.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 10, 1998**

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Aluminum	NA	NA	NA	NA	5.8E-02	5.8E-03	6.4E-02	34.9%
Arsenic	6.8E-07	5.3E-07	1.2E-06	100.0%	5.3E-02	4.1E-02	9.4E-02	51.2%
Vanadium	NA	NA	NA	NA	1.3E-02	1.3E-02	2.6E-02	14.0%
Total	6.8E-07	5.3E-07	1.2E-06	100.0%	1.2E-01	5.9E-02	1.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33

LOCATION: MILTON, FLORIDA

EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES

MEDIA: SURFACE SOIL WITHOUT CONCRETE

DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	2.8E-04	9.8E-03	NA	3.00E-02	NA	NA	3.3E-01	100.0%
					Total	NA	NA	3.3E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 663 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 6.1E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
TPH	2300	0.01	1.40E-04	9.78E-04	NA	2.00E-02	NA	NA	4.9E-02	100.0%
Total							NA	NA	4.9E-02	100.0%

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
TPH	NA	NA	NA	NA	3.3E-01	4.9E-02	3.8E-01	100.0%
Total	NA	NA	NA	NA	3.3E-01	4.9E-02	3.8E-01	100.0%

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Intake} = \frac{\text{Cs} \times \text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

WHERE:

Cs = :	Mean concentration in soil (mg/kg)
IR = :	100 Soil Ingestion Rate (mg/day)
CF = :	1.0E-06 Conversion Factor (kg/mg)
FI = :	1 Fraction from contaminated source (unitless)
EF = :	234 Exposure Frequency (days/year)
ED = :	2 Exposure Duration (years)
BW = :	15 Body Weight (kg)
ATc = :	25,550 Averaging time for carcinogenic exposures (days)
ATn = :	730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = : 1.2E-07 kg-soil/kg-wt/day

Chronic Daily Intake = : 4.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day)⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7886	9.6E-04	3.4E-02	NA	3.00E-01	NA	NA	1.1E-01	100.0%
					Total	NA	NA	1.1E-01	100.0%

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
 LOCATION: MILTON, FLORIDA
 EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
 MEDIA: SURFACE SOIL WITHOUT CONCRETE
 DATE: JULY 28, 1998

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
 EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
 ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:
$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where: Cs = : Mean concentration in soil (mg/kg)
 CF = : 1.0E-06 Conversion factor (kg/mg)
 SA = : 663 Skin surface available for contact (cm²/event)
 AF = : 0.2 Soil to skin adherence factor (mg/cm²)
 ABS = : Absorption factor (unitless)
 EF = : 234 Exposure frequency (events/year)
 ED = : Exposure duration (years)
 BW = : Body weight (kg)
 ATc = : 25,550 Averaging time for carcinogenic exposures (days)
 ATn = : 730 Averaging time for noncarcinogenic exposures (days)

Unit Dose

Lifetime Chronic Daily Intake = 1.2E-06 kg-soil/kg-wt/day
 Chronic Daily Intake = : 4.3E-05 kg-soil/kg-wt/day

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RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33****LOCATION: MILTON, FLORIDA****EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES****MEDIA: SURFACE SOIL WITHOUT CONCRETE****DATE: JULY 28, 1998**

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor (mg/kg/day) ⁻¹	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Iron	7886	0.001	9.58E-06	3.35E-04	NA	4.50E-02	NA	NA	7.4E-03	100.0%
Total							NA	NA	7.4E-03	100.0%

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RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: NAVAL AIR STATION WHITING FIELD - SITE 33
LOCATION: MILTON, FLORIDA
EXPOSURE SCENARIO: HYPOTHETICAL ON-SITE CHILD RESIDENT - CENTRAL TENDENCY EXPOSURES
MEDIA: SURFACE SOIL WITHOUT CONCRETE
DATE: JULY 28, 1998

Chemical	Lifetime Cancer Risk				Hazard Index			
	Incidental Ingestion	Dermal Contact	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Total HI	Percent HI
Iron	NA	NA	NA	NA	1.1E-01	7.4E-03	1.2E-01	100.0%
Total	NA	NA	NA	NA	1.1E-01	7.4E-03	1.2E-01	100.0%

APPENDIX E

SOIL LEACHABILITY EXCEEDENCE SUMMARY TABLE

TABLE E-1
SOIL LEACHABILITY EXCEEDENCE SUMMARY TABLE
SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON FLORIDA

Page 1 of 3

Site No.	Chemical of Potential Concern	Frequency of Detection/ No. Samples	Range of Detected Analyte Concentrations (mg/kg)	Location of Maximum Concentration	Background Screening Value (mg/kg)	FAC 62-777 Leachability (mg/kg)
3	dieldrin	2/30	0.001/ 0.026	3SB1-5-7(93)	NA	0.004
	aluminum	29/30	214/59600	3SB6-5-7(93)	13,917	XX
	cobalt	6/30	0.87/3.2	3SB1-5-7(93)	0.74	XX
	copper	25/30	0.36/11.1	3SB5-10-12(93)	4.4	XX
	iron	30/30	86.1/32600	3SB2-5-7(93)	9,055	XX
	lead	28/30	0.6/8.3	W03SB01201	4.2	XX
	manganese	30/30	0.88/39.4	3SB5-5-7(93)	21.3	XX
4	benzene	1/24	0.77	W04SB00103	NA	0.007
	chloromethane	1/24	0.017	W04SB00602	NA	0.01
	ethylbenzene	8/24	0.002/13	W04SB00602	NA	0.6
	methylene chloride	1/24	0.069	W04SB00104	NA	0.02
	toluene	5/24	0.001/20	W04SB00602	NA	0.5
	xylenes (total)	11/24	0.002/46	W04SB00602	NA	0.2
	2-methylphenol	3/24	0.047/0.31	W04SB00602	NA	0.3
	4-methylphenol	3/24	0.072/0.5	W04SB00602	NA	0.03
	N-nitroso-di-n-propylamine	6/24	0.014/0.061	W04SB00302-D	NA	0.04
	aluminum	24/24	366/29600	W04SB00702	13,917	XX
	copper	8/24	0.55/9	W04SB00902-D	4.4	XX
	iron	24/24	57.3/22400	W04SB00902	9,055	XX
	lead	24/24	0.51/15.3	W04SB00702-D	4.2	XX
	manganese	21/24	0.67/116	W04SB00902	21.3	XX
	trichloroethene	1/14	0.073	6SB3-117-119(92)	NA	0.03
6	dieldrin	1/14	0.013	6SB1-5-7(92)	NA	0.004
	aluminum	14/14	175/39800	6SB2-15-17(92)	13,917	XX
	chromium	13/14	1.1/39.4	6SB2-15-17(92)	11.4	38
	copper	14/14	0.44/10.3	6SB2-15-17(92)	4.4	XX
	iron	14/14	237/18900	6SB1-15-17(92)	9,055	XX
	lead	14/14	0.19/21.1	6SB1-5-7(92)	4.2	XX
	manganese	14/14	0.77/73.7	6SB1-5-7(92)	21.3	XX

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TABLE E-1
SOIL LEACHABILITY EXCEEDENCE SUMMARY TABLE
SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON FLORIDA

Page 2 of 3

Site No.	Chemical of Potential Concern	Frequency of Detection/ No. Samples	Range of Detected Analyte Concentrations (mg/kg)	Location of Maximum Concentration	Background Screening Value (mg/kg)	FAC 62-777 Leachability (mg/kg)
30	trichloroethene	4/36	0.001/0.16	30SB1-5-7(92)	NA	0.03
	N-nitroso-diphenylamine	1/36	0.71	30SB00303	NA	0.4
	naphthalene	4/36	0.046/20	30SB04-5-7(93)	NA	1.7
	aluminum	23/23	105/41800	W30SB01201	13,917	XX
	cobalt	5/23	1/2.3	30SB6-10-12(93)	0.74	XX
	copper	18/23	0.48/9.1	W30SB01201	4.4	XX
	iron	23/23	67/24500	W30SB01201	9,055	XX
	lead	21/23	0.23/22	30SB04-5-7(93)	4.2	XX
	manganese	22/23	0.29/177	30SB1-5-7(92)	21.3	XX
	TPH	23/33	2.7/21200	30SB04-5-7(93)	NA	340
32	1,2-DCE (total)	3/74	0.002/0.43	WRSB01(5-7)	NA	4/7
	benzene	4/74	0.017/1.4	WR-SB03(15-17)	NA	0.007
	chloromethane	2/74	0.002	W32SB01603	NA	0.01
	ethylbenzene	9/74	0.001/5.1	WR-SB01(5-7)-D	NA	0.6
	methylene chloride	8/74	0.004/0.61	WR-SB01(5-7)-D	NA	0.02
	tetrachloroethene	3/74	0.39/1.7	WR-SB01(5-7)-D	NA	0.03
	toluene	9/74	0.002/13	WR-SB01(5-7)	NA	0.5
	trichloroethene	3/74	0.005/1.3	WR-SB01(15-17)	NA	0.03
	xylene (total)	13/74	0.008/32	WR-SB01(5-7)	NA	0.2
	naphthalene	14/74	1.1/26	WR-SB01(5-7)	NA	1.7
	aluminum	62/62	6.9/33200	32SB5-5-7(93)	13,917	XX
	cobalt	11/62	0.51/2.5	32SB7-5-7(93)	0.74	XX
	copper	45/62	0.49/8.4	32SB6-10-12(93)	4.4	XX
	iron	62/62	29.8/16000	32SB5-5-7(93)	9,055	XX
	lead	60/62	0.13/6.4	W32SB01604	4.2	XX
	manganese	53/62	0.21/53.5	32SB5-5-7(93)	21.3	XX
	TPH	9/42	2.0/2650	32SB7-30-32(93)	NA	340

TABLE E-1
SOIL LEACHABILITY EXCEEDENCE SUMMARY TABLE
SITES 3, 4, 6, 30, 32, AND 33
NAS WHITING FIELD, MILTON FLORIDA

Page 3 of 3

Site No.	Chemical of Potential Concern	Frequency of Detection/ No. Samples	Range of Detected Analyte Concentrations (mg/kg)	Location of Maximum Concentration	Background Screening Value (mg/kg)	FAC 62-777 Leachability (mg/kg)
33	ethylbenzene	1/36	1.5	33SB2-5-7(92)	NA	0.6
	xlenes (total)	3/36	0.002/4.8	33SB2-5-7(92)	NA	0.2
	dieldrin	1/28	0.013	33SB2-2-4(92)	NA	0.004
	aluminum	28/28	36.8/47800	33SB5-5-7(92)	13,917	XX
	chromium	27/28	0.85/70	W33SB01201	11.4	38
	cobalt	6/28	1.3/1.8	33SB4-3-5(92)	0.74	XX
	copper	27/28	0.54/11.1	33SB5-5-7(92)	4.4	XX
	iron	28/28	67.4/22300	33SB5-5-7(92)	9,055	XX
	lead	37/38	0.26/24.3	33SB2-5-7(92)	4.2	XX
	manganese	28/28	0.32/169	33SB4-3-5(92)	21.3	XX
	TPH	20/32	2.1/7790	33SB2-5-7(92)	NA	340

XX = Site-specific leachability values to be derived using the SPLP or TCLP test.

NA = Not Applicable

SPLP = Synthetic Precipitation Leaching Procedure.

TCLP = Toxicity Characteristic Leaching Procedure.

APPENDIX F
RESPONSES TO USEPA AND FDEP COMMENTS

FINAL RESPONSE TO COMMENTS

EPA Review Comments Remedial Investigation Report for Sites 3, 4, 6, 30, 32 and 33 September 1998

General Comments

In Section 5, tables were used to summarize the data for each site and compare maximum detected concentrations to federal and state screening criteria. The screening criteria utilized were EPA Region III Risk-Based Concentrations (RBCs), adjusted to a Hazard Quotient = 0.1, and Florida Department of Environmental Protection residential and industrial soil cleanup goals. It appears that many of the values utilized as screening criteria were rounded. In most instances the rounding would not likely have a significant effect on the evaluation of the data. However, in some instances where the screening criteria value is relatively high, as in the case for aluminum, the rounding is significant. For example, the EPA Region III RBC for aluminum based on an industrial setting is 87,000 milligrams per kilogram (mg/kg). In the tables presented in Section 5, the screening criteria was rounded to 100,000 mg/kg. It is not clear why rounding was utilized. It is recommended that actual screening values be used.

Response:

The screening values in Section 5 tables will be revised to show the industrial and residential soil screening values listed in EPA Region III RBC Table dated 10/1/98. A footnote will also be added to the table stating that for non-carcinogens the RBCs will be multiplied by a factor of 0.1 to adjust for a Hazard Quotient of 0.1. It is noted that after applying the 0.1 adjustment factor, the EPA Region III RBC (10/1/98) for aluminum based on an industrial setting is 200,000 mg/kg.

Figures depicting sampling locations and results in the RI Report do not identify the key features (i.e. suspected source areas) of the site such as locations of former underground storage tanks (USTs), wash racks, etc., which would allow for an adequate evaluation of the sampling data relative to these suspected source areas. All key features of the sites should be identified within all figures of the report which depict sampling results.

Response:

The figures depicting sampling locations and results will be revised to identify the locations of key features (former underground storage tanks, wash racks, etc.) in order to facilitate adequate evaluation of the sampling data.

Although the purpose of the RI Report was to focus exclusively on the soils at the respective sites and not on groundwater, groundwater issues cannot be totally ignored when evaluating soils. Surface and subsurface soil data were evaluated to assess impacts to human health and ecological receptors through direct contact, ingestion, inhalation, etc. Surface and subsurface soil risks were evaluated by comparing maximum concentrations to federal and state soil screening levels for residential and industrial scenarios. In addition, human health and ecological risk assessments were performed. However, the ability of soil contamination to contribute to groundwater contamination was not evaluated. Several sites had soil volatile organic contamination (VOC), both chlorinated and benzene, toluene, ethylbenzene and xylene (BTEX), as well as polycyclic aromatic hydrocarbon

(PAH) contamination in the parts per million (ppm) range. These areas may be contributing to the groundwater contamination noted at several of these sites. In particular, Sites 4, 32, and 33 had BTEX contamination, and sites 30 and 32 had chlorinated VOC contamination at specific locations in the ppm range within the soils. It is recommended that soil screening levels be developed as outlined in the EPA guidance document *Soil Screening Guidance: Users Guide, April 1996, Publication 9355.4-23* which evaluates the potential for soil to leach contaminants to groundwater. These levels should then be compared to the levels of contamination found at the sites to assess/evaluate the soil contamination's potential to impact groundwater.

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance.

Specific Comments

1. **Page 3-1, Section 3.1 First Paragraph.** This section indicates that soil gas samples were collected from 220 sampling points. However, Page 3-2 indicates only 206 locations (106 locations at Sites 3 and 32, 56 locations at Site 30, and 44 locations at Sites 5, 6, and 33). This discrepancy should be addressed.

Response:

The text will be revised to clarify that a total of 206 soil gas samples were collected at Sites 3, 4, 5, 6, 30, 32, and 33 (106 locations at Sites 3 and 32, 56 locations at Site 30, and 44 locations at Sites 5, 6, and 33).

2. **Page 3-4, Figure 3-1.** This figure depicts soil boring locations for Sites 3, 4, and 32. However, soil boring 3SB07 is not depicted on this figure. The figure should be modified to include 3SB07.

Response:

The figure will be modified to show the location of soil boring 3SB07.

3. **Page 5-2, Section 5.2.1.1 First Paragraph.** Section 5.2.1.1 indicates that Table 5-2 includes EPA Region III residential RBCs. This section and the table should be modified to indicate that 1/10th of the RBCs was used for screening purposes for non-carcinogenic contaminants.

Response:

The text and tables in Section 5 will be revised to indicate that for non-carcinogens, 1/10th of the Region III RBCs were used for screening purposes.

4. **Page 5-6, Section 5.2.1.1, Fifth Paragraph.** This section states that pesticides were detected in four samples (3SB1-0-2, 3SB2-1-1, W035B01301, and 3SB13). It appears that W035B01301 should be changed to W03SB01301, and 3SB2-1-1 should be changed to 3SB2-1-2.

Response:

The text will be revised to identify the correct sample numbers.

5. **Page 5-8, Section 5.2.1.1, First Paragraph.** This paragraph indicates that 14 analytes were detected above background soil concentrations. However, Figure 5-2 does not include five of the analytes (calcium, iron, magnesium, potassium, and sodium) which exceeded background soil concentrations. For example, according to Table 5-2, iron (maximum concentration 12,900 mg/kg) exceeded its residential RBC screening value (2,300 mg/kg). While these contaminants are essential nutrients, they either should be factored into discussions concerning comparisons to background, or the report should clearly state that these essential nutrients are not considered under the contaminant evaluation. The report should also note when any of these essential nutrients exceeds a risk based criteria.

Response:

Section 5 of the report will be revised to include a discussion of the essential nutrients and state that only iron will be included in the evaluation of nature and extent and the human health risk assessment.

6. **Page 5-30, Section 5.2.2.1, Second Paragraph.** This paragraph states that vanadium exceeds its EPA Region III RBC. However, according to Table 5-6, vanadium exceeded only the state criteria, not the EPA criteria. Additionally, iron (maximum concentration 14,800 mg/kg) exceeded its residential RBC screening value (2,300 mg/kg). The RI Report should address these issues.

Response:

The text will be revised to indicate that only the Florida criterion was exceeded for vanadium and that iron exceeded the residential RBC screening value.

7. **Page 5-40, Section 5.2.2.3, First Paragraph.** This section summarizes findings of analytical data from Site 4. However, the adequacy of the Site 4 investigation is difficult to assess. Analytical data are depicted on figures with scales much too large to assess the sampling locations with respect to the former underground storage tank (UST) locations. Background information indicates that nine USTs and shallow disposal areas for sludge tank bottoms were located at Site 4. If available, historical maps/blue prints should be used to identify the location and orientation of these tanks. Site 4 reportedly covers an area of 2.5 acres. It appears that only three soil borings were placed within the area where the former USTs were located, with the remainder of the borings located on the periphery. Analytical data from these three soil borings (4SB01, 4SB03, and 4SB06) indicate residual contamination, including VOC, semi-volatile organic contamination (SVOC), and PAH is still present. It is not clear whether these soil borings were located in areas expected to contain the highest concentrations of contaminants. Given this, it does not appear that three soil boring locations are adequate to assess residual contamination from nine USTs in an area covering 2.5 acres. In addition, the data should be presented on smaller scale maps which depicts the suspected former UST locations as well as the shallow tank bottom sludge disposal areas.

Response:

Soil borings 4SB01, 4SB03, and 4SB06 were placed within the boundary of the tank pit (approximately 0.5 acre) in locations expected to contain the highest concentrations of contaminants. Based on the elevated FID readings encountered at these locations, which indicated a high level of contamination, the remaining soil borings were stepped out to define the lateral extent of contamination. The figures and text will be clarified for Site 4 will be modified to depict the location of the former USTs. However, the exact location of the tank bottom sludge disposal areas, which are reported to be next to the USTs, is not known and can not be drawn on the Site 4 figures.

Additionally, while soil data were screened against residential and industrial risk based screening criteria, the data were not screened against screening levels designed to evaluate the potential for soils to impact groundwater. Background data indicate groundwater contamination with BTEX constituents. These constituents were detected in soil samples in the part per million range, which may indicate a potential continuing source for groundwater contamination. It is recommended that the soil screening levels be developed as outlined in EPA guidance document *Soil Screening Guidance: Users Guide, April 1996, Publication 9355.4-23* to assess/evaluate the soil contamination's potential to impact groundwater.

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance.

8. **Page 5-42, Section 5.2.3.1, Third Paragraph.** This paragraph indicates that eighteen of the nineteen detected SVOC were detected in sample 6SB3-02 or its associated duplicate sample. However, according to Table 6-9, nineteen of nineteen SVOCs were detected in 6SB3-02 or its associated duplicate. Table 6-9 indicates no other detections of SVOCs in any other samples. The text indicates that pyrene was detected in sample 6SB4-0-2. This discrepancy should be clarified.

Response:

The text will be revised to be consistent with Table 5-9, which is correct. Nineteen of nineteen SVOCs were detected in 6SB3-02 or its associated duplicate. No other detections of SVOCs were found in any other samples. Also, the text will be revised to delete the reference to a pyrene detection in sample 6SB4-0-2.

9. **Page 5-47, Section 5.2.3.1, Fourth Paragraph.** This paragraph details the inorganic analytical results for soil samples from Site 6, with the text of the paragraph correctly indicating that manganese concentrations exceeded EPA Region III RBCs (at a level of 0.1HQ). However, manganese is not found on Figure 5-10, which depicts inorganic contamination at Sites 6 and 33. The figure should be revised to include the manganese detections.

Response:

Manganese was not depicted on Figure 5-10 since it did not exceed the background concentration of 201.5 mg/kg for the Troup Loamy Soil and Dothan/Lucy/Bonifay Soil found at Site 6. Only inorganics that exceeded background concentrations were plotted on the figures in Section 5 as stated in the text on page 5-47.

10. **Page 5-49, Section 5.2.3.1, First Paragraph.** This paragraph indicates that the maximum detected concentration of chromium in Site 6 surface soils was 30 mg/kg in 6SB4-02. However, according to Table 5-10, sample 6SB3-0-2 contained a chromium concentration of 65 mg/kg. These discrepancies should be addressed.

Response:

The text will be revised to note the maximum detected concentration of chromium at Site 6 in surface soils was 65 mg/kg in sample 6SB3-0-2.

11. **Page 5-49, Section 5.2.3.2, Third Paragraph.** This paragraph indicates that 14 SVOCs were detected at only one sampling location (6SB3). However, Table 5-11 indicates that 13 SVOCs were detected at 6SB3. This discrepancy should be resolved.

Response:

The text will be revised to indicate 13 SVOCs were detected, as the table illustrates.

12. **Page 5-59, Figure 5-13.** This figure and subsequent figures specific to Site 30 should identify the location of the wash rack and waste oil tanks so that the adequacy of the soil sampling locations relative to these areas can be assessed.

Response:

The appropriate figures will be revised to identify the location of the wash rack and waste oil tanks.

13. **Page 5-85, Section 5.2.5.1, First Paragraph.** This paragraph discusses the results of inorganic analyses performed on surface soil samples collected at Site 32. This paragraph states that only two analytes (aluminum and vanadium) exceeded either Florida Department of Environmental Protection (FDEP) or EPA Region III soil screening levels for residential soil. However, according to Table 5-18, antimony, arsenic, and iron also exceeded one of the screening levels mentioned above. This discrepancy should be clarified.

Response:

The text will be revised to reflect the information included in Table 5-18.

14. **Page 5-86, Figure 5-18.** Figure 5-18 depicts inorganic contaminants found in surface soil at Site 32. Since iron was detected above EPA residential soil screening criteria, iron results should also be included on Figure 5-18.

Response:

The figure will be revised to include iron results that exceed background concentrations.

15. **Page 5-85, Section 5.2.5.2, Second Paragraph.** This paragraph discusses the volatile organic analytical data detected in subsurface soil samples at Site 32. The relatively high VOC analytical data cited in this paragraph were from samples collected during July 1993 from soil borings designated with a "WR". However, these results are not included on Figure 5-19 which depicts surface soil analytical results for Site 32. Either the results from the July 1993 soil borings should be included in Figure 5-19 or an additional figure should be prepared so that a complete evaluation of the contamination identified at the site can be made.

Response:

Figure 5-19 will be revised to identify the wash rack (i.e., "WR") sample locations and provide the associated results.

16. **Page 5-88, Table 5-19.** Table 5-19 consists of eight pages. Page 2 of the table designated as Page 5-88 of the RI Report was not included in the report. The page should be included as part of the next submission of the report.

Response:

This page will be included in the next submission.

17. **Page 5-97, Section 5.2.5.2, Sixth Paragraph.** This paragraph discusses the results of total petroleum hydrocarbons (TPH) analyses. This section should note that the FDEP soil screening criteria (2,500 mg/kg) was exceeded in several samples.

Response:

The text will be revised to identify the two samples (i.e., 32SB7-15-17 at 2580 mg/kg and 32SB7-30-32 at 2650 mg/kg) that exceeded the FDEP soil screening criteria for TPH.

18. **Page 5-99, Section 5.2.5.3, Second Paragraph.** This section summarizes the results of the Site 32 investigation. The second paragraph discusses findings with respect to VOC contamination. A statement should be added to this section indicating that the majority of the VOC contamination was located within 20 feet below ground surface.

Response:

The text will be revised to note the majority of the VOC contamination was located within 20 feet of ground surface.

19. **Page 5-104, Section 5.2.6.1, First Paragraph.** This paragraph discusses the results of volatile organic compounds detected at the site. The paragraph states that all seven VOCs detected at Site 33 were detected in 33B00301. However, according to Table 5-21 only six of the seven VOCs were detected in this sample; xylenes were not detected in 33B00301. This discrepancy should be addressed.

Response:

Xylenes were not detected in 33B00301, but were detected in sample 33SB5-0-2-D. The text will be revised to correct this discrepancy.

20. **Page 5-115, Section 5.2.6.2, First Paragraph.** This paragraph discusses inorganic constituents detected in subsurface samples at Site 33. The paragraph specifies that 15 non-nutrient analytes were detected above background. However, only 14 were listed in the paragraph. The report should include copper as an analyte detected above background.

Response:

The text will be revised to include copper.

21. **Page 5-116, Figure 5-21.** Figure 5-21 should include the location of the former UST associated with Site 33. Additionally, the figure is labeled as representing "organics" in subsurface soil samples at Site 33. This figure label should be changed to indicate "inorganic".

Response:

The figure will be revised as suggested.

22. **Page 6-60, Section 6.7, Third Paragraph.** This section indicates that the concentration of TPH in surface soils at Site 30 was (2,660 mg/kg). However, according to Table 5-14, concentrations as high as 9,610 mg/kg were detected. This discrepancy should be resolved, and the risk assessment re-evaluated if necessary.

Response:

The correct value for Site 30 is 9,610 mg/kg. The risk assessment will be revised to include the correct value for Site 30.

23. **Page 9-1, Section 9.0.** The conclusions and recommendations should be re-evaluated to include any revisions required based on an evaluation of the potential for soil contamination to migrate to groundwater.

Response:

The text will be revised to note the potential for soil contamination to leach to groundwater is currently being addressed under the Site 40, Basewide Groundwater Investigation.

**EPA Review Comments for the Human Health
& Ecological Risk Assessment Sections of the Remedial
Investigation Report, Sites 3, 4, 6, 30, 32, and 33**

General Comments

1. In general, the methods used in estimating the ecological risks from these sites are sufficiently conservative. However, the TRV tables (Tables 7-2 and 7-3) used in the risk assessment have numerous errors. Several of the chemicals have LOAEL derived TRVs that were calculated by multiplying NOAEL values by 10. While deriving NOAEL values from LOAEL values by dividing by ten is often conducted, deriving LOAELs from NOAELs is not an accepted practice. LOAELs that are not reported in Sample et al. (1996) should be reported as "NA" and not derived by multiplying the NOAEL by ten. Furthermore, many of the LOAELs indicated as "NOAEL*10" are actually reported in Sample et al. (1996) and thus should be referenced accordingly.

The inaccuracies in Tables 7-2 and 7-3 are carried through in calculations for the Food Chain Modeling Hazard Quotients on Tables 7-6, 7-9, 7-12, 7-15, 7-18 and 7-21. These hazard quotients should be recalculated once the TRV values are corrected. Furthermore, a systematic error appears to be occurring in the calculation of hazard quotients for the red fox and red-tailed hawk. The calculations for the red fox and red-tailed hawk should be verified.

Response:

The foodchain modeling calculations, related input data, and references, including receptor-specific parameters and chemical-specific TRVs, will be checked and revised, where necessary. LOAELs that were derived by multiplying NOAELs by a factor of 10 will be deleted and will be reported as not available ("NA") if a suitable LOAEL cannot be located. Hazard quotient calculations for the red fox and the red-tailed hawk will be reviewed and verified.

2. The "Other Risk Characterization" tables (Tables 7-7, 7-10, 7-13, 7-16, 7-19 and 7-22) use the average concentration of each chemical at the sites rather than the highest detection at each site. In order to provide a conservative screening level assessment, either the maximum detected concentration or the 95% upper confidence limit (UCL) should be used, as well as the average.

Response:

The tables mentioned in the comment were developed to provide balance to the highly conservative screening-level assessment. Maximum detected concentrations were used as the conservative, initial exposure point concentrations in the assessment. Hence, the focus of the "Other Risk Characterization" tables and related discussion is intended to be less conservative and qualitative in nature. The use of the maximum concentrations is not directly applicable. It should be noted that national EPA (Environmental Response Team) and the Navy have recently indicated that the use of these less conservative items is considered part of Step 3 ("Step 3a") in the 8-step ERA process and should be incorporated into the report once Steps 1 and 2 are completed. As a result, the "other risk characterization" methods, results, and discussion utilizing the average chemical concentrations will be titled "Step 3a" in the revised report.

3. **Because the TRV tables, the Hazard Quotient tables and the Other Risk Characterization tables should be revised, a review of the discussion and conclusions was not performed. After revisions have been made to the affected tables the discussion and conclusions should be reviewed.**

Response:

Once the TRV, Hazard Quotient, and Other Risk Characterization tables are revised, the text will be reviewed and modified as appropriate.

4. **The data for the background samples was not included in the risk assessment. As a result it is unclear whether the selection of the background location(s) was appropriate. The locations and analytical data associated with the background should be presented in the document in summary form. Inclusion of this information in an Appendix would be sufficient.**

Response:

Section 6.2, page 6-3 of the human health risk assessment refers to specific figures and tables in the 1998 ABB Environmental Services, Inc. *Remedial Investigation and Feasibility Study General Information Report* (GIR). These figures and tables provide background data, including sample locations, summary statistics, and background screening values. Additionally, a reference will be added to Section 7.2.4 to guide the reader to this information.

5. **The references used for this document are incomplete. Four citations in the text of Section 7 are not included in the reference section: Burt and Grossenheider 1980, Lancaster 1998, Sample et al. 1996, and Simon 1997. Furthermore, the citations to USEPA documents are not clearly referenced in cases where more than one USEPA document from the same year is used. The references should be corrected.**

Response:

The citations in the text that were not included in the reference section will be added to the reference section. USEPA references from the same year will be distinguished properly in the text and the reference section of the report.

6. **The references do not include the most recent USEPA "Guidelines for Ecological Risk Assessment" released April 1998. This document should be referenced.**

Response:

USEPA's "Guidelines for Ecological Risk Assessment" released in April 1998 will be referenced in the methods section of the ERA.

7. **The analytical protocols and methodology were not provided for any of the analytical parameters. Review of reporting limits in Appendix B and in Appendix C indicate that methodologies were appropriate. However, please provide specific information regarding the analytical protocols and methodology used at these sites.**

Response:

The following text will be added to the document for clarification. Environmental and quality control samples were collected and analyzed at an off-site laboratory using contract laboratory program (CLP) methodology for analysis of VOCs, SVOCs, pesticides, PCBs, total petroleum hydrocarbons, metals and cyanide. Gas chromatography (GC) and/or mass spectroscopy methods were used for analysis of VOCs by Method 8240, SVOCs by Method 8270, and organochlorine pesticides/PCBs by Method 8080. Inorganic analytes were analyzed by inductively coupled plasma, graphite

furnace atomic absorption, or cold vapor atomic absorption, as appropriate (e.g., Methods 6010, 7420, or 7470). Cyanide analyses were performed using Method 9010 and TPH analyses were performed using Florida Pro or Method 418.1. The laboratory analytical program is described in more detail in Section 2.2 of the NAS Whiting Field GIR (HLA, 1998).

8. There was no summary of the number or types and frequency of QC samples used during this investigation. Sample identifications were used in reviewing data in Appendix C to determine the number of QC samples utilized at each site. The results are as follows:

Site 3 (38 samples, not including QC) - 5 sets of Duplicates, no MS/MSD
Site 4 (41 samples, not including QC) - no Duplicates, 2 sets of MS/MSD
Site 6 (17 samples, not including QC) - 1 set of Duplicates, no MS/MSD
Site 30 (59 samples, not including QC) - 4 sets of Duplicates, no MS/MSD
Site 32 (84 samples, not including QC) - 7 sets of Duplicates, no MS/MSD
Site 33 (48 samples, not including QC) - 4 sets of Duplicates, no MS/MSD

It appears that duplicate samples were collected roughly once per every 10 samples. However, only 2 sets of MS/MSD samples were done for the entire area, according to the sample identifications for each site. If this is true, the lack of MS/MSD data represent a weakness in the data set and should be discussed in the uncertainty sections. To verify the QC performed, please provide a summary table which indicates the number and frequency of QC samples used at each site.

Response:

All sites had MS/MSD samples collected during sampling events; however, these data were inadvertently omitted from this report. MS/MSD data and a summary table of the QC data will be included in Appendix B.

SPECIFIC COMMENTS

1. Chapter 4. A discussion of Data Quality Objectives for Representativeness and Comparability were not included in Chapter 4 of the document. Representativeness is generally measured through the use of field QC, such as rinsate and trip blanks, and laboratory QC samples, such as method and preparation blanks. A Comparability assessment involves the documented use of consist sampling, shipping and analytical protocols. Since these parameters were included for other sites at Whiting Field, it is assumed that these DQO parameters are included in the Work Plan and should be included for this site.

Response:

The text will be revised to include a discussion of these DQO parameters in Section 4.

2. Page 6-15, Section 6.2.2. This section presents the surface and subsurface soil sampling conducted at Site 4. The intended meaning of the sentence regarding the selection of polycyclic aromatic hydrocarbons (PAHs) as contaminants of potential concern (COPCs) is unclear due to a typographical error. The text states that "according to Section 2.5.5 of the GIR (General Information Report), was selected as a COPC [i.e., benzo(a)pyrene], all carcinogenic PAHs will be retained as COPCs." The text should corrected to read "according to Section 2.5.5 of the GIR, if one carcinogenic PAH is selected as a COPC [i.e., benzo(a)anthracene], all carcinogenic PAHs will be retained as COPCs." The text should be corrected accordingly.

Response:

The typographical error will be corrected accordingly.

3. **Page 6-30, Figure 6-1 . The figure presents the Conceptual Site Model for Sites 3, 4, 6, 30, 32, and 33. The figure lists the trespasser/adult receptor twice as a human receptor and fails to include the trespasser/older child receptor. The figure should be corrected accordingly.**

Response:

The figure will be corrected so the trespasser/adult and trespasser/child are each listed once as a receptor.

4. **Table 7-2, page 7-12 and 7-13. Table 7-2 does not appear to be complete or correct. Benzo(b)fluoranthene appears twice in the table. Acenaphthene, benzo(a)pyrene, 2,4-dimethylphenol, fluorene, naphthalene, and manganese are not included in the table but are chemicals detected at one or more sites. These chemicals should be included in Table 7-2.**

The TRVs for 2-methylnaphthalene, carbazole, and phenanthrene are referenced to Sample et al. (1996). These values were not found in the referenced document. Butylbenzyl phthalate does not have a reference cited. These TRVs should be verified.

The TRVs reported in Table 7-2 do not correspond to values in Sample et al. (1996) for the following compounds: beryllium, copper, cyanide, selenium, zinc, pentachlorophenol, 4,4'-DDD, 4,4'-DDT and Aroclor-1254/1260. These TRVs should be verified.

Response:

Response: The TRVs, TRV references, and analytes on Table 7-2 will be re-evaluated and corrected, where necessary.

5. **Table 7-3, pages 7-14 and 7-15. Benzo(a)anthracene appears twice in the table. Acenaphthene, 2,4-dimethylphenol, fluorene, naphthalene, and manganese are not included in the table but are chemicals detected at one or more sites. These chemicals should be included in Table 7-3.**

The TRVs for pentachlorophenol are attributed to Sample et al. (1996). These values were not found in the referenced document. These TRVs should be verified.

The TRVs reported in Table 7-2 do not correspond to values in Sample et al. (1996) for the following compounds: bis(2-ethylhexyl)phthalate, dieldrin, selenium and vanadium. These TRVs should be verified.

Review of Sample et al. (1996) indicates there are more conservative TRVs for aluminum and 4,4'-DDT than those reported in Table 7-3. The most conservative TRVs should be used.

Response:

The TRVs and analytes on Table 7-3 will be re-evaluated and corrected, where necessary. The most conservative TRVs in Sample et al. (1996) will be used.

Response:

The typographical error will be corrected accordingly.

3. **Page 6-30, Figure 6-1 . The figure presents the Conceptual Site Model for Sites 3, 4, 6, 30, 32, and 33. The figure lists the trespasser/adult receptor twice as a human receptor and fails to include the trespasser/older child receptor. The figure should be corrected accordingly.**

Response:

The figure will be corrected so the trespasser/adult and trespasser/child are each listed once as a receptor.

4. **Table 7-2, page 7-12 and 7-13. Table 7-2 does not appear to be complete or correct. Benzo(b)fluoranthene appears twice in the table. Acenaphthene, benzo(a)pyrene, 2,4-dimethylphenol, fluorene, naphthalene, and manganese are not included in the table but are chemicals detected at one or more sites. These chemicals should be included in Table 7-2.**

The TRVs for 2-methylnaphthalene, carbazole, and phenanthrene are referenced to Sample et al. (1996). These values were not found in the referenced document. Butylbenzyl phthalate does not have a reference cited. These TRVs should be verified.

The TRVs reported in Table 7-2 do not correspond to values in Sample et al. (1996) for the following compounds: beryllium, copper, cyanide, selenium, zinc, pentachlorophenol, 4,4'-DDD, 4,4'-DDT and Aroclor-1254/1260. These TRVs should be verified.

Response:

Response: The TRVs, TRV references, and analytes on Table 7-2 will be re-evaluated and corrected, where necessary.

5. **Table 7-3, pages 7-14 and 7-15. Benzo(a)anthracene appears twice in the table. Acenaphthene, 2,4-dimethylphenol, fluorene, naphthalene, and manganese are not included in the table but are chemicals detected at one or more sites. These chemicals should be included in Table 7-3.**

The TRVs for pentachlorophenol are attributed to Sample et al. (1996). These values were not found in the referenced document. These TRVs should be verified.

The TRVs reported in Table 7-2 do not correspond to values in Sample et al. (1996) for the following compounds: bis(2-ethylhexyl)phthalate, dieldrin, selenium and vanadium. These TRVs should be verified.

Review of Sample et al. (1996) indicates there are more conservative TRVs for aluminum and 4,4'-DDT than those reported in Table 7-3. The most conservative TRVs should be used.

Response:

The TRVs and analytes on Table 7-3 will be re-evaluated and corrected, where necessary. The most conservative TRVs in Sample et al. (1996) will be used.

6. **Section 7.5.1, page 7-22, paragraph 4.** There appears to be a typographical error in the third sentence: The magnitude of the HQs were also be evaluated. This error should be corrected.

Response:

The sentence will be corrected accordingly.

7. **Table 7-6, page 7-27.** This table presents the Food Chain Modeling Hazard Quotients for Site 3. There appears to be an error in the hazard quotients for silver. Table 7-2 (mammals) does not report TRVs for silver, yet hazard quotients have been calculated for the mammals. Furthermore, Table 7-3 (birds) does report TRVs for silver yet hazard quotients are not calculated for the birds on Table 7-6. These inconsistencies should be corrected.

Response:

The hazard quotients for both mammals and birds will be checked and Table 7-6 revised appropriately.

8. **Table 7-11, page 7-36.** This table presents the Selection of Surface Soil Contaminants of Potential Concern for Site 6. There appears to be errors for iron and manganese. Iron is not selected as a chemical of potential concern (COPC) even though its maximum detected concentration is two times the average background. In addition, manganese is selected as a COPC even though its maximum detected concentration is not two times the average background.

Response:

The status of iron and manganese as COPCs on Table 7-11 will be corrected accordingly.

9. **Table 7-12, page 7-37 .** This table presents the Food Chain Modeling Hazard Quotients for Site 6. There appears to be errors in the hazard quotients for butylbenzyl phthalate and vanadium. Table 7-12 does not report hazard quotients for butylbenzyl phthalate for the mammals even though Table 7-2 reports TRVs for butylbenzyl phthalate. There appears to be a mathematical error in the calculations of the mammalian hazard quotients for vanadium. These calculations should be verified.

Response:

Table 7-12 calculations will be verified and the table revised accordingly.

10. **Table 7-15, page 7-42.** This table presents the Food Chain Modeling Hazard Quotients for Site 30. There appears to be errors in the hazard quotients for naphthalene, manganese and silver. Tables 7-2 and 7-3 do not report TRVs for naphthalene or manganese, yet hazard quotients have been calculated for these chemicals. Table 7-2 (mammals) does not report TRVs for silver, yet hazard quotients have been calculated for the mammals. Furthermore, Table 7-3 (birds) does report TRVs for silver yet hazard quotients are not calculated for the birds on Table 7-15. These inconsistencies should be corrected.

Response:

The TRVs and hazard quotients for naphthalene, manganese, and silver will be verified and Table 7-15 revised accordingly.

11. **Table 7-18, page 7-47.** This table presents the Food Chain Modeling Hazard Quotients for Site 32. There appears to be errors in the hazard quotients for acenaphthene, manganese and silver. Tables 7-2 and 7-3 do not report TRVs for acenaphthene, yet hazard quotients have been calculated for this chemical. Table

7-2 (mammals) does not report TRVs for silver, yet hazard quotients have been calculated for the mammals. Furthermore, Table 7-3 (birds) does report TRVs for silver yet hazard quotients are not calculated for the birds on Table 7-18. These inconsistencies should be corrected.

Response:

The TRVs and hazard quotients for acenaphthene, manganese, and silver will be verified and Table 7-18 revised accordingly.

- 12. Section 7.6.1, page 7-55. This section discusses the uncertainty in the preliminary problem formulation. The section states, "Since active operations have not occurred at the site in several years, the potentially impacted areas at each sub-unit are difficult to initially define." This statement is counter to the repeated references to an actively used air field for propeller planes and helicopters in section 7.2. This apparent inconsistency should be corrected or clarified.**

Response:

The sentence was inadvertently added to the text and will be deleted.

- 13. Appendix B. Appendix B presents the results of field QC samples such as trip blanks, field blanks, and rinsate blanks. These results are all reported in ug/kg (solid units), although all of these samples are assumed to be DI water. The reporting limits also appear to indicate that a low concentration VOC analysis was performed, however, the methodology has not been provided. In addition, the data indicate that every compound was detected in every sample since none of the values have a U qualifier to indicate that they were not detected. Please provide a reference for the method of analysis, verify the reporting units for these QC samples and clarify the results as detects or nondetects.**

Response:

The data in Appendix B will be revised to show the correct units and the proper qualifier. A discussion of the methodology used will be added to the text.

FINAL RESPONSE TO COMMENTS

FDEP Review Comments Remedial Investigation Report for Sites 3, 4, 6, 30, 32, & 33 September 1998

1. **The title of the report should be " The Remedial Investigation Report for Surface and Subsurface Soil at..."**

Response:

The title and text will be revised as suggested.

2. **At the conclusion of each site investigation, recommendations regarding possible well placement should be included in a groundwater assessment or a statement as to why none are recommended should also be included.**

Response:

Since evaluation of groundwater was not part of this remedial investigation, recommendations on the placement of additional wells are not appropriate. The text will be revised to note groundwater is currently being assessed in the base-wide groundwater investigation for Site 40 and well placement recommendations are included in the Work Plan for Site 40.

3. **The map on page 1-2 shows essentially nothing and should be revised.**

Response:

The map on page 1-2 will be deleted as suggested.

4. **Similar to the Table 1-1, a table showing the number, supposed contents and disposition history of all ASTs and USTs at each site should be prepared. Additionally, please insure that accurate (to the degree possible) locations are shown on appropriate figures.**

Response:

A new table listing the USTs and ASTs at each site will be added to Section 1. The locations of these tanks will be shown on the appropriate figures.

5. **Was building 1478, the old transformer repair shop, and the surrounding area, evaluated?**

Response:

Building 1478, the old transformer repair shop, and the surrounding area were investigated as part of the Site 5, Battery Acid Seepage Pit, investigation. Geraghty & Miller, Inc. investigated Site 5 located next to Building 1478, in June of 1985. After the Consent Order for Site 5 was closed (FDER letter dated 15 April, 1987), Site 5 went into no further action status. Four soil borings were installed around the site. In addition, at each of the boring locations, a 4-inch diameter monitoring well (WHF 5-2, WHF 5-3, WHF 5-4, and WHF 5-1) was installed to a total depth of 142 to 147 feet BLS.

6. **Refer to page 1-12: what is APU thinner? What was the nature (unpaved ditch, concrete pipe, etc.) of the storm sewer at the wash rack? What is (was) the nature of the cleaning solution (that was used at the rate of 4200gallons per year)?**

Response:

The earliest references to APU thinner are contained in the Initial Assessment Study (IAS) by Envirodyne Engineers, Inc. The IAS notes APU thinner was used for helicopter maintenance operations at the South Field. Base personnel identified APU as an acronym for "all-purpose Universal." The exact composition of the thinner is unknown. It was estimated 180 gallons per year (from 1980 -1984) were generated. This waste was drummed and sent off-site for disposal. The text will be revised to note APU thinner was used at South Field, not North Field.

Originally, the storm sewer system at the wash rack appears to have consisted of underground vitrified clay piping. In the early 1970s, the wash rack was connected to the sanitary sewer system using concrete pipe. Several other piping modifications appear to have been made over the years of operation of the wash rack, but specific piping details are not known.

The cleaning solution used at the rate of 4,200 gallons per year at North Field consisted of detergent/soap to wash aircraft. The exact composition of the cleaning solution is unknown.

7. **Refer to page 1-13: what was the disposition of the tank at Building 1454 (is it in the new table)?**

Response:

The tank was abandoned in place and filled with sand. The new table in Section 1 will include a description of this tank.

8. **Section 1.4, Regulatory Setting: a discussion of the appropriate Florida rules and regulations should be included, including a discussion of the leaching testing and data application that is required by Florida.**

Response:

A discussion of appropriate Florida regulations that have been utilized in preparing the RI Report will be added to Section 1.4.

- 8a **The discussion of Florida rules and regulations to be added to Section 1.4 should be included in the comment response.**

Response:

Per CERCLA Section 121(d), the Navy will follow all applicable or relevant and appropriate requirements of the State of Florida for all IR program activities at NAS Whiting Field.

9. **The Navy intends to evaluate groundwater at NAS Whiting Field as a separate endeavor; however, there is some question as to the practicality of doing this in light of the fact that the state of the art of investigation at IRP sites has developed along the lines of a continuing and consequent knowledge of site soil and ground water. I question the ability of the Navy to adequately conduct site assessments and soil assessments on a strictly separate basis, especially in cases where a ground water investigation may precede complete soil investigation. When the NAS Whiting Field Partnering Team was considering making the ground water a separate site, my thinking along those lines primarily concerned how we would deal with the remedial aspects of the ground water at NASWF and not necessarily**

with the assessment aspects of each site; now, I am questioning the wisdom of our actions. I am requesting that we revisit that decision at an early date and confirm that the decision was correct. If it is not the best way to pursue the investigations, we should be prepared to modify our actions accordingly.

Response:

In all cases, except possibly Sites 38 and PSC 1485C the soil investigation will either precede or be performed concurrently with the groundwater investigation. If these or any future site investigations reveal soil contamination leaching to groundwater or other groundwater contaminants the ROD for groundwater Site 39 & 40 will be modified to reflect these changes. Since the groundwater plume is commingled in many areas, assessment of the groundwater as one site appears to be a practical alternative. The confusing part of the process appears to be capturing and making sure all of the groundwater and soil leaching issues identified in the individual site soil assessments are addressed in the Site 39 & 40, Basewide Groundwater Remedial Investigation. To ensure this, the groundwater and soil leaching issues identified in each of the individual soil RI Reports are currently being tabulated and included in the Work Plan for Site 40. This issue can be discussed at the 13-14 April Partnering Meeting.

- 10. Section 5.1, Geologic Setting and at site-specific discussions: these various site-specific discussions concerning perched water tables and clay layers should also be consolidated as one section that pertains to the absence or presence of (a) perched zone(s). This is important in that such a zone(s) may be a continuing source of contamination to the ground water and deeper zones at particular site, which has great implications as to whether a site has been sufficiently evaluated after the usual surface/subsurface investigation(s). Maps and isopachs should also be presented for that (those) zone(s), if those data are available.**

Response:

The perched water table was not investigated as part of the Remedial Investigation of Sites 3, 4, 6, 30, 32, and 33. The general perched water table information, described in Section 5.1, was taken from Technical Memorandums 1 and 2. A detailed description of the perched water tables will be provided in the Site 39 & 40 Basewide Groundwater Remedial Investigation Report.

- 11. Table 5-2, 5-6 and other similar tables for other sites should also consider leachability values as compared to the appropriate leachability values for soils in Chapter 62-785, F.A.C.**

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 39 & 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance. A copy of the soil leachability screening table developed for the Site 39 & 40 Work Plan showing chemicals at Site 3, 4, 6, 30, 32, and 33 exceeding FAC 62-777 leachability screening criteria will be referenced in the text and included as an appendix.

- 12. Section 5.2, Soil Assessment: please insure that the data from the investigation sufficiently characterizes the areal extent of any contaminants, to the degree that the data can be utilized to prepare IM or FS tasks for any necessary remedial action(s). Please be aware that insufficient contaminant delineation during the RI**

phase has necessitated additional delineation during remedial actions. If the present conditions of separate soil and ground water investigations continues, this becomes more important.

Response:

The data from the soil assessment will be reviewed to insure sufficient characterization of the areal extent of any contaminants has occurred. Chemicals exceeding two times background and either USEPA Region III RBCs or Florida SCTLs will be identified with an asterisk on the Section 5 figures to make it easier to identify the areas exceeding RBCs or SCTLs.

- 13. Section 5.2.1.1, Surface Soil: please present assurance that comparison of the soils at this and all other sites are compared to the background soil type, in this case, to the Troup Loamy Soil, and that graphic presentations of such data such as Figure 5-1 (and all similar figures) sufficiently characterize the areal extent of contamination, as previously mentioned in the comments on Section 5.2.**

Response:

All of the sites were compared to the appropriate background soil type. Troup loamy soil is present at all sites except Site 6. Site 6 consists of Troup loamy soil and Dothan/Lucy/Bonifay soil. Background soil types, for surface soil comparison at each site are stated in the text and footnoted in the summary of surface soil analytical results tables for each site. Figure 5-1 and similar figures will be reviewed as stated in the response to Comment No. 12.

- 14. Please carefully consider the comment from page 2 of Dr. Roberts' letter regarding "a thick layer of concrete" serving to prevent a complete exposure pathway at certain sites. It is important that the Navy address this concern, as it is directly related to the problem of not only future exposure risks, but also in the future when the concrete may be removed or repaired, when it may contaminate the surface/subsurface soil and ground water by virtue of leaching from soil that was formerly covered by concrete. Has the Navy adequately addressed both the risk and the leaching scenario for any or all of the sites that are covered in the RI? If not, we need to discuss this and assure that it has been addressed properly.**

Response:

For comparison and completeness purposes, Tetra Tech will calculate the risk of exposure to surface soils under hypothetical future use assuming the concrete layer is removed exposing the soil. These calculations will be included in Appendix E of the RI Report. The text will be revised to include the results of the hypothetical future use risk calculations and will note, a complete exposure pathway does not currently exist because of the thick layer of concrete.

The potential for leaching is being performed as part of the Site 39 & 40 remedial investigation; however, review of the leachability screening table, developed as part of the Site 39 & 40 Work Plan, indicates several chemicals exceed the Florida FAC 62-777 screening values in the areas presently covered by concrete.

Land use controls should be implemented to ensure the concrete or other similar materials remain in place at Sites 30, 32, and 33 to prevent exposure to surface soil and/or leaching. The use of land use controls will be evaluated in the Feasibility Study and, if agreed upon, will be documented in the Record of Decision.

FINAL RESPONSE TO COMMENTS

University of Florida Review Comments Remedial Investigation Report for Sites 3, 4, 6, 30, 32, & 33 September 1998

Human Health Risk Assessment

General Comments

Soils at this site were screened against Florida Soil Cleanup Target Levels (SCTLs) and Region III Risk-Based Concentrations (RBCs). However, the preference of FDEP is to screen all soil samples against values for leachability based on groundwater criteria, found in Table I of the Technical Report for Chapter 62-785, F.A.C. Screening against leachability numbers will have some impact on the selection of chemicals of potential concern (COPCs) for this site. For example, for subsurface soils at Site 4, chloromethane, ethylbenzene, toluene, total xylenes, 2-methylphenol, and n-nitroso-di-n-propylamine would be included as COPCs. As calculated at present and included in this report, risk/hazard estimates may change somewhat, therefore this RIR may be of limited use as a risk management tool.

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 39 & 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance. A copy of the soil leachability screening table, develop for the Site 39 & 40 Work Plan, showing chemicals at Site 3, 4, 6, 30, 32, and 33 exceeding FAC 62-777 leachability screening criteria will be referenced in the text and included as an appendix.

It should also be noted that subsurface soil was screened against industrial/commercial SCTLs/RBCs. This further limits the usefulness of this RIR from a risk management standpoint. When calculating risk/hazard based on future residential use, the screening of subsurface soil against industrial/commercial values implies that site soils would not be disturbed if this area were to undergo residential construction.

Response:

Screening subsurface soil against industrial/commercial SCTLs/RBCs is in accordance with the risk assessment procedures outlined in the GIR and is consistent with the approach used for preparing the human health risk assessments at other NAS Whiting Field sites.

Department Guidelines in Chapter 62-785.680(2)(b)1&2 F.A.C., requires institutional controls or other methods to prevent human exposure to contaminated subsurface soil.

Response:

The surface soil at Sites 3, 4, 6, 30, 32, and 33 were screened against residential SCTLs to determine the COPCs which were then evaluated for future residents and other selected exposure scenarios. Based on the human health risk assessment, the surface soil at each of these sites poses an unacceptable risk requiring an institutional control or other remedial action. The institutional control/remedial action required for the surface soil will be selected/evaluated in the feasibility study to prevent unacceptable human exposure to both surface and subsurface soil. Changes in site conditions, such as exposing contaminated soil, will be adequately addressed by the institutional controls.

Specific Comments

Iron was inappropriately screened out of the COPC selection process based on its status as an essential nutrient. According to Region IV guidance, iron may not be eliminated for this reason. Chemicals which may be eliminated as essential nutrients (if their concentrations are such that they do not pose a risk) are calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium.

Response:

The human health risk assessment will be revised so iron is not screened out of the COPC selection based on its status as an essential nutrient. However, it should be noted that the RfD currently available for iron is only a provisional value. There is high uncertainty attached to risk estimates developed based on the provisional RfD and the utility of such risk estimates is very limited.

It should be noted that, since this RIR was submitted in September 1998, an updated Region III RBC Table has been released. The RBC for chromium VI in soil has been revised, for residential exposure from 390 mg/kg to 230 mg/kg and for industrial/commercial exposure from 10,000 mg/kg to 6,100 mg/kg. The value of 230 mg/kg for residential contact is below the Florida residential SCTL for chromium VI (290mg/kg). This change should be reflected in tables as appropriate, and chromium VI should be included as a COPC where the screening values are exceeded.

Response:

The tables will be changed to reflect the latest EPA Region III RBCs dated 10/1/98. Chromium VI will be included as a COPC where the screening values are exceeded.

There are discrepancies between sampling reports as stated in Section 5 (Investigative Results) and Section 6 (Human Health Risk Assessment). For example, Tetra Tech states on page 5-30 that "twenty-four subsurface soil samples and five duplicates were collected at Site 4 in 1998 and analyzed for VOCs, SVOCs, Pesticides/PCBs, TPH, and metals." Table 5-8 (Summary of Subsurface Soil Analytical Results at Site 4) lists 52 analytes and also indicates that 24 samples were analyzed for this Site. However, Tetra Tech indicates on page 6-5 that one sample was collected at Site 4 from 2-15 feet below ground surface (bgs) and six samples were collected from 2-22 feet bgs, for a total of seven samples. Tables 6-4A and 6-4B (Occurrence, Distribution, and Selection of Chemicals of Concern for Site 4 Subsurface Soil) also indicate that seven samples were analyzed for Site 4, and Table 6-4B lists 44 analytes. Although it appears that the samples in Section 6 may be a subset of the samples in Section 5, it is unclear a) why there is a discrepancy in the number of samples and b) which section contains the corrects data. The same type of apparent discrepancy also exists for Site 3 subsurface soil, Site 6 subsurface soil, Site 30 surface soil, Site 32 subsurface soil, and Site 33 subsurface soil.

Response:

It is correct Section 6 contains a subset of the data in Section 5. Both sets of data are correct for their respective intended purposes. Section 5 contains analytical results and statistics, including analytical data for all soil samples collected. Section 6 only includes the analytical data utilized for the risk assessment pathways shown on Figure 6-1. The data utilized for the risk assessment generally includes the analytical data for the samples collected from the land surface to a depth of 15 feet (to 22 feet for Site 4). Surface soil samples (0 to 2 feet) collected under concrete or asphalt at Sites 30, 32, and 33 were not included in the risk assessment data set since the concrete or asphalt prevented direct exposure to the soil material. However, surface samples (0 to 2 feet) collected under concrete or asphalt at Sites 30, 32, and 33 will be included in the risk assessment data set for future resident. Please also see the response to FDEP Comment No. 14.

Regarding Sites 32 and 33, Tetra Tech states on page 6-22 that "a thick layer of concrete covers the surface soil at Site 32 [and Site 33]. Therefore, a complete exposure pathway does not exist." It should be made clear that a complete exposure pathway does not exist *at the present time*. Unless there is some mechanism to ensure that a thick layer of concrete overlies these sites *both now and in the future*, risk/hazard for future use should be predicted upon exposure to surface soils. Also regarding these sites, it is stated on page 6-52 that "if the concrete would be removed, clean fill would be used as the replacement." Is there some mechanism in place to ensure that this would be the case?

Response:

See the response to FDEP Comment No. 14

Risk/hazard from inhalation exposure was not calculated for any receptor because "inhalation exposures represent a relatively minor exposure relative to dermal and ingestion pathways (Table 6-11, Selection of Exposure Pathways)." Rather than disregard potential risk/hazard from inhalation exposure, Tetra Tech should include this exposure pathway in the calculations. For example, since chromium VI is a carcinogen only through the inhalation route, potential cancer risks from this COPC were not calculated. After inhalation risk/hazard from COPCs is determined, it can then be concluded whether the risk/hazard is negligible.

Response:

Tetra Tech has compared the maximum concentrations of chromium VI and the other chemicals driving the risk at each site with the USEPA generic Soil Screening Levels (SSLs) for the migration of contaminants from soil to air. All maximum concentrations of these chemicals are well below the respective SSLs, except where no SSLs were developed because no toxicity criteria are available for the inhalation exposure route [e.g., benzo(a)pyrene]. Because the SSLs were established at a cancer risk level of 1×10^{-6} and an HI equal to 1, concentrations less than the SSLs represent negligible risk (i.e., risk less than benchmarks). Tetra Tech will compare maximum concentrations of all other COPCs to the SSLs and will calculate inhalation risk for any COPCs with maximum concentrations exceeding the EPA SSTLs for migration of chemicals from soil to air.

There seems to be some confusion as to the derivation of dermal toxicity factors. In Section 6, Tables 6-23 and 6-24 (Non-Cancer Toxicity Data – Oral/Dermal and Cancer Toxicity Data – Oral/Dermal, respectively), Tetra Tech presents the oral toxicity values, oral to dermal adjustment factors (i.e., gastrointestinal absorption), and adjusted dermal toxicity values for COPCs. Region IV guidance states that when "appropriate data are available on oral absorption of a specific chemical, they should be used to make the administered/absorbed dose adjustment...in the absence of chemical-specific data, the Region IV OTS has adopted the following

oral adsorption efficiencies...80% for volatile organic chemicals, 50% for semi-volatile organic chemicals, 20% for inorganic chemicals." For all the COPCs listed, data for gastrointestinal (GI) absorption are available from either the ATSDR Toxicant Profiles or the Hazardous Substances Data Bank (HSDB). The table below lists COPCs identified by Tetra Tech, the GI absorption used in this RIR to extrapolate dermal toxicity factors, and the chemical-specific absorption factors. Tetra Tech references Region IV supplemental guidance to RAGS as the source for its GI absorption factors; however, the guidance as quoted above is the only guidance specified by Region IV. It should be noted that correction of the GI absorption values will also change the dermal toxicity values used by Tetra Tech in the RIR.

COPC	GI Absorption Used by Tetra Tech	Literature GI Absorption	Reference
Aroclor - 1260	0.9	0.85	ATSDR
arsenic	0.41	0.95	ATSDR
aluminum	0.1	0.04	ATSDR
benzo(a)anthracene	0.31	0.5	ATSDR
benzo(a)pyrene	0.31	0.5	ATSDR
benzo(b)fluoranthene	0.31	0.5	ATSDR
benzo(k)fluoranthene	0.31	0.5	ATSDR
chrysene	0.31	0.5	ATSDR
dibenz(a,h)anthracene	0.31	0.5	ATSDR
indeno(1,2,3- cd)pyrene	0.31	0.5	ATSDR
dieldrin	0.5	1.0	HSDB
chromium VI	0.02	0.013	ATSDR
vanadium	0.01	0.03	ATSDR

Response:

Tetra Tech used GI Absorption Factors from a table provided by EPA Region IV (Dr. Ted Simon) dated June 1997. The table will be referenced in the text as the source of the GI Absorption Factors.

Are the GI Absorption Factors used by TtNUS (provided by Dr. Simon, EPA, in June 1997) current and are they acceptable to EPA?

Response:

Based on a telephone conversation with Dr. Simon in early June 1999, the GI Absorption Factors used by TtNUS are acceptable to EPA. Dr. Simon did state that the GI Absorption values proposed by the University of Florida (UF) might be better data but an evaluation of the studies used as a basis for UF's GI factors would have to be performed to make that determination. In addition, the use of the UF's GI Adsorption Factors will not change the recommendation to perform a feasibility study at each site since the calculated human health risks, using TtNUS' GI Adsorption factors, at each of the sites is unacceptable.

Receptor-specific exposure parameters (both reasonable maximum exposure [RME] and central tendency [CT] are presented in Appendix D-1. The exposure parameters for an older child trespasser are listed in Table D1-1. The surface area for this receptor is 1,013 cm²-year/kg. The surface area should be derived assuming a child receptor has the hands, one-half the arms and one-half the legs

available for dermal contact (i.e., wearing shorts and a short-sleeved shirt). As Tetra Tech has not specified the age of the older child trespasser, they should do so and derive an appropriate surface area. The construction worker scenario parameters (Table D1-6) are for RME only, and the exposure frequency and duration for these workers is 30 days/year for one year. Since the length of construction projects frequently seem to exceed one month, this value seems to be more indicative of CT than RME. A more conservative approach would be to assess the short-term construction worker (i.e., 30 days/year) and the longer-term construction worker (i.e., 60-90 days/year). Additionally, for non-carcinogens, if the exposure frequency is set to 30 days, then the averaging time should be 42 days (30 days plus weekends). Tetra Tech instead incorrectly used an averaging time of one year.

Response:

Page 6-32 of the report specifies the older child trespasser receptor was considered to be 7-16 years old. The 1,013 cm²-year/kg is an appropriate and defensible age/body weighted surface area for the 95th percentile (RME) case. The derivation of the value was presented in the *Remedial Investigation and Feasibility Study, General Information Report, Naval Air Station Whiting Field, Milton, FL (GIR)* (ABB Environmental Services, Inc., January 1998). The GIR contains much of the risk assessment protocol historically used for Whiting Field. Protocol for the evaluation of the dermal contact with soil is presented starting on page C-5-3 of Appendix C-5. The protocol used a USEPA assumption, 25% of the total body surface area would be available for soil contact. Based on data presented in Table 6-8 of the USEPA *Exposure Factors Handbook* (August 1997), this is roughly in line with the recommendation to use the surface area of the hands, one-half the arms, and one-half the legs (for example, 27% for the 12- to 13-year-old child). The formula for dermally absorbed dose for a child includes the summation for each year of age from 7 through 16 of the surface area divided by the body weight:

$$DA_{\text{child}} = [(C_{\text{soil}} * AF * ABS * CF * EF)/AT] \sum_i (SA_i * ED_i/BW_i)$$

Where

DA_{child} = dermally absorbed dose for a child [mg/kg-day]

C_{soil} = contaminant concentration in soil [mg/kg]

AF = adherence factor of soil to skin [mg/cm²-event]

ABS = absorption fraction [dimensionless]

CF = units conversion factor [10⁻⁶ kg/mg]

EF = exposure frequency [events/year]

AT = averaging time [days] (=ED for noncarcinogens; 25,550 days for carcinogens)

SA_i = surface area exposed at age i [cm²]

ED_i = exposure duration at age i [years] = 1 year

BW_i = body weight at age i [kg]

i = age 7 through age 16

Summing the final column of this table for ages 7<8 through 16<17 provides the value for $\sum_i (SA_i * ED_i/BW_i)$ for the RME (95th percentile). The RME value is 115.9 + 113.6 + 108.8 + 107.6 + 104.7 + 100.8 + 94.0 + 88.2 + 88.5 + 90.8, or 1,013 cm²-year/kg. Tetra Tech conservatively used the RME value for the CT exposure.

The 30-days/year exposure frequency is the duration specified for the construction worker scenario; in the GIR, Appendix C-2, Table C-2-4 (adult excavation worker). The GIR also specifies an exposure duration of one year. Although these are assumed values, they appear reasonable for the sites in question and are consistent with the exposure frequency and exposure duration used in previous RIs. In addition, even though the calculated excavation worker risk would change using the values suggested

above, the risk at all sites is still acceptable (cancer risk less than 1 E-6 and HI less than 1.0).

Cancer risk calculations are shown in Appendix D-5. In several of the tables in this section, the cancer slope factors are incorrectly listed and appear to be oral reference doses instead. However, the cancer risks appear to have been calculated correctly. In all of the tables for adult/child residential receptors, the COPC-specific intake values are not listed.

Response:

The cancer slope factors in Appendix D-5 will be checked and revised as necessary. Tetra Tech will include adult/child residential receptor COPC-specific intake values in the appropriate tables.

Ecological Risk Assessment

Tetra Tech dismisses ecological receptors to most of the sites in this RIR on the basis of noise from adjacent taxiways and runways. However, there are well-documented populations of terrestrial wildlife in busy metropolitan airports, most notably (in Florida) rabbits and burrowing owls. It has also been demonstrated that industrialization and human activity do not preclude use of an area by potential ecological receptors. It is unclear, however, if a walk-through assessment of an populations of ecological receptors has been performed at this site. It is further stated on pages 7-3, 7-4, and 7-5 that "no rare, threatened, or endangered species are located on or near the site (Lancaster, 1998)." There is no reference for Lancaster; however, there is a reference for Lassiter, which is perhaps what the authors intended to state.

Response:

Indeed, certain types of wildlife can adapt to urban environments, including extremely noisy areas on and near airports. However, these areas are also characterized by favorable habitat, such as wetlands or extensive old fields. As discussed in the ERA, the sites investigated in this RI are in a highly developed area characterized by buildings, concrete, and asphalt with only scattered ornamental trees and mowed turfgrass present. The periphery of the North Field area is characterized by better habitat in quality and quantity, but this area is outside the boundaries of the sites investigated in this ERA. It should also be noted, only certain types of wildlife can adapt to noisy, urban environments. These include some species of birds and small mammals. Yet, many of these species cannot always complete their entire life cycle (i.e., sensitive life stages) in such environments. A site visit by a TtNUS ecologist was conducted in Spring 1998 and only a modicum of wildlife was observed. Heavy human activity and loud flight operations were prevalent.

The reference stated in the comment should be (Lassiter, 1998) and will be changed accordingly.

Table 7-2 lists toxicity reference values for the selected endpoint ecological receptor species. These values were generally taken from the 1996 revision of *Toxicological Benchmarks for Wildlife*. Although the Benchmarks provides estimated *wildlife* toxicity values extrapolated from values measured in laboratory animal models (usually rats or mice), Tetra Tech uses the toxicity value (NOAEL and LOAEL) determined in the laboratory species. The Benchmarks does not extrapolate toxicity values for all representative ecological species chosen by Tetra Tech, but when this is the case, the extrapolated values should be used. For example, for aluminum, Tetra Tech uses the NOAEL and LOAEL determined in the mouse, when an extrapolated value is given for the red fox, which is an endpoint

terrestrial ecological receptor chosen for the analysis. Additionally, it would be helpful if intermediate food chain modeling calculations were provided. Again using the risk to the red fox from exposure to aluminum, at Site 3 the hazard quotient based on a NOAEL is listed as $5.7E+02$. In reproducing this calculation, using equations provided in the ERA and input values as shown in Tables 7-2 and 7-4, it appears that this value should be $1.2E+03$ using a NOAEL for a laboratory mouse (1.93 mg/kg/day). When the extrapolated NOAEL for the red fox is used (0.551 mg/kg/day), the hazard quotient becomes $4.3E+03$. Tetra Tech should therefore confirm calculations presented in this section, and further confirm that toxicity reference values are the most appropriate for the chosen endpoint ecological receptors.

Response:

In general, the extrapolated TRVs in Sample et al. (1996) were calculated using factors Region 4 EPA does not recommend or accept, such as metabolic scaling factors. Region 4 recommends only the use of a factor of 10 to extrapolate an NOAEL to an LOAEL from laboratory studies. As a result, the TRVs from the laboratory studies are consistently used in all cases in this ERA. The calculations for the foodchain modeling will be checked and revised, where necessary.

RESPONSE TO COMMENTS

Florida Department of Environmental Protection Comments Remedial Investigation Report for Sites 3, 4, 6, 30, 32, & 33 February 2, 2000

University of Florida Comments

1. It appears from their responses to a number of our comments related to the validity of assumptions about future exposure to soils that Tetra Tech and the Navy are planning to rely heavily on institutional site controls to limit such exposure. The reliability of proposed institutional controls is an issue that FDEP will have to address.

Response:

The actions required to implement and ensure the reliability of proposed institutional controls will be included in the Land Use Control Implementation Plan developed by the Navy in consultation with FDEP and EPA. The above response applies to both the above University of Florida comment and the similar FDEP comment.

2. In our review of the RIR, we commented on the GI absorption values used by Tetra Tech in the route-to-route extrapolation of toxicity values. Apparently, these GI absorption values were provided to Tetra Tech by Dr. Ted Simon of USEPA Region 4. Despite USEPA Region 4's apparent blessing of these values, we are compelled to take exception to the GI absorption value for arsenic. We have seen this value misused on several occasions. The GI absorption value for arsenic of 0.41 comes from a report by Bettley and O'Shea (*British Journal of Dermatology*, 92: 563-568, 1975). In this study 8.52 mg of a soluble arsenite was administered to seven human subjects. The estimated percentage of the administered dose that remained in the bodies of these subjects after ten days ranged from 0.41 to 0.76. From these observations, some have inferred a GI absorption of 41% (corresponding to the lower end of this range). This is not correct. Other studies have shown that urinary excretion of an intravenous arsenic dose in humans is also about 60-70% of the dose, indicating that the oral absorption of arsenic is nearly complete. The ATSDR Toxicant Profile for arsenic lists a bioavailability value of 0.95 for arsenic from the Bettely and O'Shea study. This would be a better value to use.

Response:

The Navy conservatively used the lower GI absorption value (0.41) in accordance with informal EPA guidance.

The GI absorption value is used to adjust oral cancer slopes and reference doses (RfD) to obtain dermal cancer slopes and RfDs as shown in the following equations. Also, as seen in the following example calculations the lower the GI absorption value the higher the calculated dermal risk.

For Direct Contact Dermal Cancer Risk

$$\text{Dermal Cancer Slope Factor} = \frac{\text{Oral Cancer Slope Factor}}{\text{GI Absorption Factor}}$$

AND

$$\text{Cancer Risk} = \text{Lifetime Chronic Daily Intake} * \text{Dermal Cancer Slope Factor}$$

Example Dermal Cancer Risk Calculation Using Site 3 Adult Trespasser Data

Chemical	GI Absorption Factor	Oral Cancer Slope	Calculated Dermal Cancer Slope	Lifetime Chronic Daily Intake	Lifetime Cancer Risk
Arsenic	0.41	1.5E+00	3.66E+00	5.09E-07	1.86E-06
Arsenic	0.95	1.5E+00	1.58E+00	5.09E-07	8.04E-07

For Direct Contact Dermal Hazard Index (Noncarcinogenic Risk)

$$\text{Dermal Reference Dose (RfD)} = \text{Oral RfD} * \text{GI Absorption Factor}$$

AND

$$\text{Hazard Index (HI)} = \text{Chronic Daily Intake} / \text{Dermal RfD}$$

Example Dermal Hazard Index Calculation Using Site 3 Adult Trespasser Data

Chemical	GI Absorption Factor	Oral RfD	Calculated Dermal RfD	Chronic Daily Intake	Hazard Index
Arsenic	0.41	3.00E-04	1.23E-04	1.78E-06	1.45E-02
Arsenic	0.95	3.00E-04	2.85E-04	1.78E-06	6.25E-03

As shown above, the calculated dermal cancer risk and HIs using UF's GI absorption value (0.95) are approximately 57 percent lower than the values calculated using the EPA Region 4 GI absorption value of 0.41. However, use of UF's GI Absorption value (0.95) will not change the recommendation to perform a feasibility study at each site since the total calculated risk (dermal, ingestion, and inhalation) for each site will still exceed the Florida target cancer risk of 1×10^{-6} . Therefore, at this time the Navy does not plan to recalculate the dermal risk values for each site using UF's arsenic absorption value of 0.95.

The Navy does agree the 0.95 arsenic GI absorption value is listed in Table 4-1 of the 6 November 1998 Peer Consultation Workshop Draft of the *Risk Assessment Guidance for Human Health Evaluation Manual, Supplemental Guidance* and is likely to be the value recommended by the USEPA when this document is finalized and published.

3. Tetra Tech has calculated risk/hazards for a construction worker scenario which they characterize as a reasonable maximum exposure (RME) estimate. The exposure frequency (EF) for this worker is 30 days/year. For the calculation of hazard quotients for non-carcinogenic COPCs, the 30 day/year EF is combined with an exposure duration (ED) and averaging time (AT) of 1 year. We must again object to the characterization of this exposure scenario as representative of a maximally exposed individual. One month is simply not an upper bound estimate of exposure at a construction site. With respect to the issue of ED and AT, Tetra Tech's use of an EF of 30 days/year with an EF (and AT) of 1 year corresponds to the improbable situation in which a construction worker visits a site 2-3 days per month over the course of a year. The problem is that since the exposure is averaged over such a long period, the daily dose of chemicals received by the receptor is lower than it should be if the exposure was assumed to occur on concurrent days. For this scenario the ED and AT should be 42 days (30 days plus weekends).

Response:

The 30 days/year exposure frequency for the construction worker (Scenario 1) was used by the Navy due to the small size of the sites in question and the type of construction (e.g. utility line repair, pavement repair, etc.) likely to be performed at these sites. Using the scenario suggested by UF, the construction worker cancer risk does not change but the HI is 8.6 times higher than the value calculated in Scenario 1. However, as shown in attached Tables F-1 through F-6, the cancer risk and HIs calculated for the construction worker scenario suggested by UF (Scenario 2) as well as for a scenario with double the exposure (Scenario 3) do not result in unacceptable risks to the construction worker at any site. The following parameters were used to calculate the cancer risk and hazard index values shown in Tables F-1 through F-6.

Scenario 1 (Values used by Tetra Tech in the RI Report)

- | | |
|---|----------|
| • Exposure frequency (EF) - | 30 days |
| • Exposure duration (ED) - | 1 year |
| • Noncarcinogenic averaging time (AT) - | 365 days |

Scenario 2 (Values suggested by UF)

- | | |
|---|---------|
| • Exposure frequency (EF) - | 30 days |
| • Exposure duration (ED) - | 1 year |
| • Noncarcinogenic averaging time (AT) - | 42 days |

Scenario 2 (EF twice Scenarios 1 and 2)

- | | |
|---|---------|
| • Exposure frequency (EF) - | 60 days |
| • Exposure duration (ED) - | 1 year |
| • Noncarcinogenic averaging time (AT) - | 84 days |

As seen from Table F-1 through F-6, even doubling the exposure frequency to 60 days does not result in unacceptable risks to the construction worker at any site. The Navy, at this time, does not plan to revise the construction worker risk assessment scenario currently included in the RI Report.

Note: All comments and their responses will be included in an appendix in the Final RI Report.

TABLE F-1

**SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 3
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1**

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker Surface Soil	Ingestion	7.2E-08	0.03	7.2E-08	0.26	1.4E-07	0.26
	Dermal Contact	6.3E-08	0.02	6.3E-08	0.17	1.3E-07	0.17
	Inhalation	--	--	--	--	--	--
	Total	1.4E-07	0.05	1.4E-07	0.43	2.8E-07	0.43
Construction Worker Subsurface Soil	Ingestion	8.0E-08	0.01	8.0E-08	0.09	1.6E-07	0.09
	Dermal Contact	7.5E-08	0.01	7.5E-08	0.09	1.5E-07	0.09
	Inhalation	--	--	--	--	--	--
	Total	1.5E-07	0.02	1.5E-07	0.17	3.0E-07	0.17

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days.

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

TABLE F-2

**SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 4
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1**

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker Surface Soil	Ingestion	5.7E-08	0.02	5.7E-08	0.17	1.1E-07	0.17
	Dermal Contact	4.6E-08	0.01	4.6E-08	0.09	9.2E-08	0.09
	Inhalation	--	--	--	--	--	--
	Total	1.0E-07	0.03	1.0E-07	0.26	2.0E-07	0.26
Construction Worker Subsurface Soil 2-15' (below land surface)	Ingestion	7.7E-08	0.01	7.7E-08	0.09	1.5E-07	0.09
	Dermal Contact	7.2E-08	0.01	7.2E-08	0.09	1.4E-07	0.09
	Inhalation	--	--	--	--	--	--
	Total	1.5E-07	0.02	1.5E-07	0.17	3.0E-07	0.17
Construction Worker Subsurface Soil 2-22' (below land surface)	Ingestion	1.7E-07	0.01	1.7E-07	0.09	3.4E-07	0.09
	Dermal Contact	7.2E-08	0.01	7.2E-08	0.09	1.4E-07	0.09
	Inhalation	--	--	--	--	--	--
	Total	2.5E-07	0.02	2.5E-07	0.17	5.0E-07	0.17

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

TABLE F-3

**SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 6
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1**

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker Surface Soil	Ingestion	2.1E-07	0.03	2.1E-07	0.26	4.2E-07	0.26
	Dermal Contact	4.1E-08	0.02	4.1E-08	0.17	8.2E-08	0.17
	Inhalation	--	--	--	--	--	--
	Total	2.5E-07	0.05	2.5E-07	0.43	5.0E-07	0.43
Construction Worker Subsurface Soil ^d	Ingestion	NA	NA	NA	NA	NA	NA
	Dermal Contact	NA	NA	NA	NA	NA	NA
	Inhalation	NA	NA	NA	NA	NA	NA
	Total	NA	NA	NA	NA	NA	NA

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days.

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

^d There are no COPCs for subsurface soil at Site 6.

TABLE F-4

**SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 30
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1**

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker Surface Soil	Ingestion	5.8E-08	0.04	5.8E-08	0.35	1.2E-07	0.35
	Dermal Contact	5.4E-08	0.02	5.4E-08	0.17	1.1E-07	0.17
	Inhalation	--	--	--	--	--	--
	Total	1.1E-07	0.06	1.1E-07	0.52	2.2E-07	0.52
Construction Worker Subsurface Soil	Ingestion	7.1E-08	0.01	7.1E-08	0.09	1.4E-07	0.09
	Dermal Contact	6.7E-08	0.01	6.7E-08	0.09	1.3E-07	0.09
	Inhalation	--	--	--	--	--	--
	Total	1.4E-07	0.02	1.4E-07	0.17	2.8E-07	0.17

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

Surface soil exposure was evaluated in the areas covered with grass.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days.

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

TABLE F-5

SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 32
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker	Ingestion	NA	NA	NA	NA	NA	NA
Surface Soil ^d	Dermal Contact	NA	NA	NA	NA	NA	NA
Subsurface Soil ^e	Inhalation	--	--	--	--	--	--
	Total	NA	NA	NA	NA	NA	NA

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days.

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

^d Concrete covers the surface soil. There is no complete exposure pathway.

^e There are no COPCs for subsurface soil at Site 32.

TABLE F-6

SUMMARY OF CONSTRUCTION WORKER CANCER RISKS AND HAZARD INDICES FOR VARIOUS EXPOSURE SCENARIOS AT SITE 33
NAS WHITING FIELD, MILTON, FLORIDA
PAGE 1 OF 1

Receptor	Exposure Route	Scenario 1 ^a		Scenario 2 ^b		Scenario 3 ^c	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Construction Worker	Ingestion	8.8E-08	0.01	8.8E-08	0.09	1.8E-07	0.09
Surface Soil ^d	Dermal Contact	8.2E-08	0.01	8.2E-08	0.09	1.6E-07	0.09
Subsurface Soil ^e	Inhalation	--	--	--	--	--	--
	Total	1.7E-07	0.03	1.7E-07	0.26	3.4E-07	0.26

The inhalation pathway was not evaluated because the maximum site concentrations did not exceed the soil to air SSLs.

^a Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 365 days.

^b Reasonable maximum exposure for an exposure frequency (EF) of 30 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 42 days.

^c Reasonable maximum exposure for an exposure frequency (EF) of 60 days, exposure duration (ED) of 1 year, and noncarcinogenic averaging time (AT) of 84 days.

^d Concrete covers the surface soil. There is no complete exposure pathway.

^e Exposure to chemicals in the subsurface soil was evaluated.